CANADIAN JOURNAL OF PHYSICS

JOURNAL CANADIEN DE PHYSIQUE

VOLUME 60, 1982

Subject Index / Index des matières[1]

00.00 GENERAL

01.00 COMMUNICATION, EDUCATION, HISTORY, AND PHILOSOPHY
01.10 Announcements, news, and organizational activities
01.30 Physics literature and publications
01.30B *Publications of lectures (advanced institutes, summer schools, etc.)*
01.30C *Conference proceedings*
01.30E *Monographs and collections*
01.30K *Handbooks, dictionaries, tables and data compilation*
01.30M *Textbooks for graduates and researchers*
01.30P *Textbooks for undergraduates*
01.30R *Surveys and tutorial papers; resource letters*
01.30T *Bibliographies*
01.40 Education
01.50 Educational aids
01.55 General physics
01.60 Biographical, historical, and personal notes
01.65 History of science
01.70 Philosophy of science
01.75 Science and society
01.90 Other topics of general interest

02.00 MATHEMATICAL METHODS IN PHYSICS
02.10 Algebra, set theory, and graph theory
02.20 Group theory
02.30 Function theory, analysis
02.40 Geometry, differential geometry, and topology
02.50 Probability theory, stochastic processes, and statistics
02.60 Numerical approximation and analysis
02.70 Computational techniques
02.90 Other topics in mathematical methods in physics

03.00 CLASSICAL AND QUANTUM PHYSICS; MECHANICS AND FIELDS
03.20 Classical mechanics of discrete systems: general mathematical aspects
03.30 Special relativity
03.40 Classical mechanics of continuous media: general mathematical aspects
03.40D *Mathematical theory of elasticity*
03.40G *Fluid dynamics, general mathematical aspects*
03.40K *Waves and wave propagation: general mathematical aspects*
03.50 Classical field theory
03.65 Quantum theory; quantum mechanics
03.70 Theory of quantized fields
03.80 General theory of scattering

04.00 RELATIVITY AND GRAVITATION
04.20 General relativity
04.30 Gravitational waves and radiation; theory
04.40 Continuous media; electromagnetic and other mixed gravitational systems
04.50 Unified field theories and other theories of gravitation
04.60 Quantum theory of gravitation
04.65 Supergravity
04.80 Experimental tests of general relativity and observations of gravitational radiation
04.90 Other topics in relativity and gravitation

05.00 STATISTICAL PHYSICS AND THERMODYNAMICS
05.20 Statistical mechanics
05.30 Quantum statistical mechanics
05.40 Fluctuation phenomena, random processes, and Brownian motion
05.50 Lattice theory and statistics; Ising problems
05.60 Transport processes, theory
05.70 Thermodynamics
05.90 Other topics in statistical physics and thermodynamics

06.00 MEASUREMENT SCIENCE, GENERAL LABORATORY TECHNIQUES, AND INSTRUMENTATION SYSTEMS
06.20 Metrology
06.20D *Measurement and error theory*
06.20F *Units*
06.20H *Measurement standards and calibration*
06.20J *Determination of fundamental constants*
06.30 Measurement of basic variables
06.30C *Spatial variables measurement*
06.30E *Mass and density measurement*
06.30F *Time and frequency measurement*
06.30G *Velocity, acceleration and rotation measurement*
06.30L *Measurement of basic electromagnetic variables*
06.50 Data handling and computation
06.60 Laboratory techniques
06.70 General instrumentation
06.90 Other topics in measurement science, general laboratory techniques and instrumentation systems

07.00 SPECIFIC INSTRUMENTATION AND TECHNIQUES OF GENERAL USE IN PHYSICS
07.10 Mechanical instruments and measurement methods
07.20 Thermal instruments and techniques
07.20D *Thermometry*
07.20F *Calorimetry*
07.20H *Furnaces*

[1]The permission of the ICSU AB, Paris, for the Canadian Journal of Physics to use this subject classification is gratefully acknowledged.

07.20K *High-temperature techniques and instrumentation; pyrometry*
07.20M *Cryogenics*
07.25 Hygrometry
07.30 Vacuum production and techniques
07.30C *Vacuum pumps*
07.30D *Vacuum meters*
07.35 High pressure production and techniques
07.50 Electrical instruments and techniques
07.55 Magnetic instruments and techniques
07.58 Magnetic resonance spectrometers, auxiliary instruments and techniques
07.60 Optical instruments and techniques
07.60D *Photometry and radiometry*
07.60F *Polarimetry and ellipsometry*
07.60H *Refractometry and reflectometry*
07.60L *Interferometry*
07.60P *Optical microscopy*
07.62 Detection of radiation (bolometers, photoelectric cells, i.r. and submillimetre waves detection)
07.65 Optical spectroscopy and spectrometers
07.65E *UV and visible spectroscopy and spectrometers*
07.65G *IR spectroscopy and spectrometers*
07.68 Photography, photographic intruments and techniques
07.75 Mass spectrometers and mass spectrometry techniques
07.77 Particle beam production and handling; targets
07.80 Electron and ion microscopes and techniques
07.85 X-ray, gamma-ray instruments and techniques
07.90 Other topics in specialised instrumentation

10.00 **THE PHYSICS OF ELEMENTARY PARTICLES AND FIELDS**

11.00 GENERAL THEORY OF FIELDS AND PARTICLES
11.10 Field theory
11.20 S-matrix theory
11.30 Symmetry and conservation laws
11.40 Currents and their properties
11.50 Dispersion relations and sum rules
11.60 Complex angular momentum; Regge formalism
11.80 Relativistic scattering theory
11.90 Other topics in general field and particle theory

12.00 SPECIFIC THEORIES AND INTERACTION MODELS: PARTICLE SYSTEMATICS
12.10 Unified field theories and models
12.20 Models of electromagnetic interactions
12.20D *Specific calculations and limits of quantum electrodynamics*
12.20F *Experimental tests of quantum electrodynamics*
12.25 Models for gravitational interactions
12.30 Models of weak interactions
12.35 Composite models of particles
12.35C *General properties of quantum chromodynamics (dynamics, confinement, etc.)*
12.35E *Applications of quantum chromodynamics to particle properties and reactions*
12.35H *Phenomenological composite models of particle structure and reactions (partons, bags, etc.)*
12.35K *Other composite models*
12.40 Models of strong interactions
12.40E *Statistical models*
12.40F *Bootstrap models*
12.40H *Duality and dual models*
12.40K *Hadron classification schemes*
12.40M *Complex angular momentum plane; Regge poles and cuts (Reggeons)*
12.40P *Absorptive, optical, and eikonal models*
12.40Q *Potential models*
12.40R *Peripheral models (one or more particle exchange)*
12.40S *Multiperipheral and multi-Regge models*
12.40V *Vector-meson dominance*
12.70 Hadron mass formulas
12.90 Miscellaneous theoretical ideas and models

13.00 SPECIFIC REACTIONS AND PHENOMENOLOGY
13.10 Weak and electromagnetic interactions of leptons
13.15 Neutrino interactions
13.20 Leptonic and semileptonic decays of mesons
13.25 Hadronic decays of mesons
13.30 Decays of baryons
13.35 Decays of leptons
13.40 Electromagnetic processes and properties
13.40D *Electromagnetic mass differences*
13.40F *Electromagnetic form factors; electric and magnetic moments*
13.40H *Electromagnetic decays*
13.40K *Electromagnetic corrections to strong and weak interaction processes*
13.60 Photon and charged-lepton interactions with hadrons
13.60F *Elastic and Compton scattering*
13.60H *Total and inclusive cross sections*
13.60K *Meson production*
13.60M *Meson-resonance production*
13.60P *Baryon and baryon resonance production*
13.65 Hadron production by electron–positron collisions
13.75 Hadron-induced low- and intermediate-energy reactions and scattering, energy $\leqslant$ 10 GeV
13.75C *Nucleon–nucleon interactions, including antinucleon, deuteron etc., energy $\leqslant$ 10 GeV*
13.75E *Hyperon–nucleon interactions (energy $\leqslant$ 10 GeV)*
13.75G *Pion–baryon interactions (energy $\leqslant$ 10 GeV)*
13.75J *Kaon–baryon interactions (energy $\leqslant$ 10 GeV)*
13.75L *Meson–meson interactions (energy $\leqslant$ 10 GeV)*
13.85 Hadron-induced high- and super-high-energy interactions, (energy $>$ 10 *GeV*)
13.85D *Elastic scattering (energy $>$ 10 GeV)*
13.85F *Inelastic scattering, two-particle final states (energy $>$ 10 GeV)*
13.85H *Inelastic scattering, many-particle final states (energy $>$ 10 GeV)*
13.85K *Inclusive reactions, including total cross sections (energy $>$ 10 GeV)*
13.85M *Cosmic ray interactions*
13.88 Polarization in interactions and scattering
13.90 Other topics in specific reactions and phenomenology of elementary particles

14.00 PROPERTIES OF SPECIFIC PARTICLES AND RESONANCES
14.20 Baryons and baryon resonances
14.40 Mesons and meson resonances
14.60 Leptons
14.80 Other and hypothetical particles

20.00 **NUCLEAR PHYSICS**

21.00 NUCLEAR STRUCTURE
21.10 General and average properties of nuclei; properties of nuclear energy levels
21.10D *Binding energy and masses*
21.10F *Shape, charge, radius and form factors*
21.10H *Spin, parity, and isobaric spin*
21.10J *Spectroscopic factors*
21.10K *Electromagnetic moments*
21.10M *Level density and structure*
21.30 Nuclear forces
21.40 Few-nucleon systems

21.60 Nuclear-structure models and methods
21.60C *Shell model*
21.60E *Collective models*
21.60F *Models based on group theory*
21.60G *Cluster models*
21.60J *Hartree-Fock and random-phase approximations*
21.65 Nuclear matter
21.80 Hypernuclei
21.90 Other topics in nuclear structure

23.00 RADIOACTIVITY AND ELECTROMAGNETIC TRANSITIONS
23.20 Electromagnetic transitions
23.20C *Lifetimes and transition probabilities*
23.20N *Internal conversion and extranuclear effects*
23.40 beta decay; electron and muon capture
23.60 alpha decay
23.90 Other topics in nuclear decay and radioactivity

24.00 NUCLEAR REACTIONS AND SCATTERING: GENERAL
24.10 Nuclear reaction and scattering models and methods
24.10H *Optical and diffraction models*
24.30 Resonance reactions and scattering
24.50 Direct reactions
24.60 Statistical theory and fluctuations
24.70 Polarization in reactions and scattering
24.75 General properties of fission
24.90 Other topics in nuclear reactions and scattering: general

25.00 NUCLEAR REACTIONS AND SCATTERING: SPECIFIC REACTIONS
25.10 Nuclear reactions and scattering involving few-nucleon systems
25.20 Photonuclear reactions and photon scattering
25.30 Lepton-induced reactions and scattering
25.40 Nucleon-induced reactions and scattering
25.50 ^{2}H- and ^{3}H-induced reactions and scattering
25.60 ^{3}He- and ^{4}He-induced reactions and scattering
25.70 Heavy-particle-induced reactions and scattering
25.80 Meson- and hyperon-induced reactions and scattering
25.85 Fission reactions
25.88 Fusion reactions
25.90 Other topics in nuclear reactions and scattering: specific reactions

27.00 PROPERTIES OF SPECIFIC NUCLEI LISTED BY MASS RANGES
27.10 $A \leqslant 5$
27.20 $6 \leqslant A \leqslant 19$
27.30 $20 \leqslant A \leqslant 38$
27.40 $39 \leqslant A \leqslant 58$
27.50 $59 \leqslant A \leqslant 89$
27.60 $90 \leqslant A \leqslant 149$
27.70 $150 \leqslant A \leqslant 189$
27.80 $190 \leqslant A \leqslant 219$
27.90 $220 \leqslant A$

28.00 NUCLEAR ENGINEERING AND NUCLEAR POWER STUDIES
28.20 Neutron physics
28.41 Fission reactor theory and design
28.42 Fission reactor materials
28.42H *Fuel preparation and reprocessing*
28.43 Fission reactor operation
28.44 Fission reactor protection systems, safety and accidents
28.50 Fission reactor types and applications
28.52 Fusion reactors
28.58 Integrated reactor systems
28.70 Nuclear explosions
28.80 Radiation technology, including shielding
28.90 Other topics in nuclear engineering and nuclear power studies

29.00 EXPERIMENTAL METHODS AND INSTRUMENTATION FOR ELEMENTARY-PARTICLE AND NUCLEAR PHYSICS
29.10 Preacceleration (injection)
29.15 Electrostatic and linear particle accelerators
29.20 Cyclic accelerators and storage facilities
29.25 Particle sources and targets, preparation and technology
29.30 Radiation spectrometers and spectroscopic techniques
29.40 Radiation detectors
29.60 Counting circuits and nuclear electronics
29.70 Radiation measurement, detection and counting
29.75 Polarization analysis
29.80 Nuclear information processing
29.90 Other topics in high-energy and nuclear experimental methods and instrumentation

30.00 **ATOMIC AND MOLECULAR PHYSICS**

31.00 THEORY OF ATOMS AND MOLECULES
31.10 General theory of structure, transitions and chemical binding
31.15 General mathematical and computational developments
31.20 Specific calculations and results
31.20D *Complete ab initio calculations (exact or nearly exact calculations on small species)*
31.20E *Ab initio LCAO and GO SCF calculations*
31.20G *Other accurate, or nearly ab initio calculations (DIM method, SAMO method, etc.)*
31.20L *Statistical model calculations (Thomas–Fermi and Thomas–Fermi–Dirac models)*
31.20N *Semi-empirical NDO calculations (CNDO, INDO, MINDO, PCILO methods, etc.)*
31.20P *Other semi-empirical calculations (Huckel, generalized Huckel, PPP methods, etc.)*
31.20R *Valence bond calculations (ab initio or not)*
31.20T *Electron correlation and CI calculations*
31.20W *Empirical methods (nonquantum methods for conformations, as Wiberg method, Westheimer method, etc.)*
31.30 Corrections to electronic structure
31.50 Excited states
31.70 Effects of molecular interactions on electronic structure
31.70D *Environmental and solvent effects*
31.70F *Potential-energy surfaces for collisions*
31.70H *Time-dependent phenomena: excitation and relaxation processes, and reaction rates*
31.70K *Molecular solids*
31.90 Other topics in the theory of atoms and molecules

32.00 ATOMIC SPECTRA AND INTERACTIONS WITH PHOTONS
32.20 Atomic spectra grouped by wavelength ranges
32.20B *Radiofrequency, microwave, and infrared spectra*
32.20J *Visible and ultraviolet spectra*
32.20R *X-ray spectra*
32.50 Fluorescence, phosphorescence
32.60 Zeeman and Stark effect
32.70 Spectral line shapes and intensities
32.80 Photon interactions with atoms
32.80B *Level crossing and optical pumping*
32.80D *Autoionization*
32.80F *Photoionization and photodetachment*
32.80H *Auger effect and inner-shell ionization*
32.80K *Multiphoton processes*

32.90 Other topics in atomic spectra and interactions with photons

33.00 MOLECULAR SPECTRA AND INTERACTIONS WITH PHOTONS
33.10 Calculation of molecular spectra
33.20 Molecular spectra grouped by wavelength ranges
33.20B *Radiofrequency and microwave spectra*
33.20E *Infrared spectra*
33.20F *Raman and Rayleigh spectra*
33.20K *Visible spectra*
33.20L *Ultraviolet spectra*
33.20N *Vacuum ultraviolet spectra*
33.20R *X-ray spectra*
33.25 Nuclear magnetic resonance and relaxation; nuclear quadrupole resonance (NQR)
33.30 Electron paramagnetic resonance and relaxation
33.35 Double resonances and other multiple resonances
33.35H *MODR and PMDR (microwave optical double resonance and phosphorescence microwave double resonance)*
33.40 Mössbauer spectra
33.45 Magneto-optical and electro-optical spectra; dichroism
33.45B *Zeeman and Stark effects*
33.45C *Magnetic circular dichroism*
33.50 Fluorescence, phosphorescence; radiationless transitions (intersystem crossing, internal conversion)
33.65 Photoelectron spectra
33.70 Intensities and shapes of molecular spectral lines and bands
33.80 Photon interactions with molecules
33.80B *Level crossing and optical pumping*
33.80E *Autoionization, photoionization, and photodetachment*
33.80G *Diffuse spectra: predissociation, photodissociation*
33.80K *Multiphoton processes*
33.90 Other topics in molecular spectra and interactions with photons

34.00 ATOMIC AND MOLECULAR COLLISION PROCESSES AND INTERACTIONS
34.10 General theories and models
34.20 Interatomic and intermolecular potentials and forces
34.40 Elastic scattering of atoms and molecules
34.50 Inelastic scattering of atoms and molecules
34.50E *Rotational and vibrational energy transfer*
34.50H *Electronic excitation and ionization (including beam-foil excitation and ionization)*
34.50L *Chemical reactions, energy disposal, and angular distribution, as studied by atomic and molecular beams*
34.70 Charge transfer
34.80 Electron scattering
34.80B *Elastic scattering of electrons by atoms and molecules*
34.80D *Atomic excitation and ionization by electron impact*
34.80G *Molecular excitation, ionization and dissociation by electron impact*
34.90 Other topics in atomic and molecular collision processes and interactions

35.00 PROPERTIES OF ATOMS AND MOLECULES; INSTRUMENTS AND TECHNIQUES
35.10 Atoms
35.10B *Atomic masses, mass spectra, abundances, and isotopes*
35.10D *Electric and magnetic moments, polarizability*
35.10F *Relativistic corrections, fine- and hyperfine-structure constants*
35.10H *Ionization potentials, electron affinities*
35.10W *Weak interactions*
35.20 Molecules
35.20B *General molecular conformation and symmetry; stereochemistry*
35.20D *Interatomic distances and angles*
35.20G *Bond strengths, dissociation energies, hydrogen bonding, etc.*
35.20J *Barrier heights (internal rotation, inversion); rotational isomerism, conformational dynamics*
35.20M *Electric and magnetic moments (and derivatives), polarizability, and magnetic susceptibility*
35.20P *Rotation, vibration, and vibration–rotation constants*
35.20S *Hyperfine- and fine-structure constants*
35.20V *Ionization potentials, electron affinities, molecular core binding energy*
35.20W *Weak interactions*
35.20X *Mass spectra*
35.20Y *Correlation times in molecular dynamics*
35.80 Atomic and molecular measurements and techniques

36.00 STUDIES OF SPECIAL ATOMS AND MOLECULES
36.10 Exotic atoms and molecules (containing mesons, muons, and other abnormal particles)
36.20 Macromolecules and polymer molecules
36.40 Atomic and molecular clusters
36.90 Other special atoms and molecules

40.00 **CLASSICAL AREAS OF PHENOMENOLOGY**

41.00 ELECTRICITY AND MAGNETISM: FIELDS AND CHARGED PARTICLES
41.10 Classical electromagnetism
41.10D *Electrostatics, magnetostatics*
41.10F *Steady-state electromagnetic fields; electromagnetic induction*
41.10H *Electromagnetic waves: theory*
41.70 Particles in electromagnetic fields: classical aspects
41.80 Particle beams and particle optics
41.80D *Electron beams and electron optics*
41.80G *Ion beams and ion optics*
41.90 Other topics in electricity and magnetism

42.00 OPTICS
42.10 Propagation and transmission in homogeneous media
42.20 Propagation and transmission in inhomogeneous media
42.30 Optical information, image formation and analysis
42.40 Holography
42.50 Quantum optics
42.52 Masers
42.55 Lasing processes
42.55B *General theory of lasing action*
42.55D *CO_2 lasers*
42.55F *Inert gas lasers*
42.55H *Lasing action in other gas lasers*
42.55K *Chemical lasers*
42.55M *Lasing action in liquids and organic dyes*
42.55P *Lasing action in semiconductors with junctions*
42.55R *Lasing action in other solids*
42.55T *Free electron lasers*
42.60 Laser systems and laser beam applications
42.60B *Design of specific laser systems*
42.60D *Laser resonators and cavities*
42.60F *Laser beam modulation*

42.60H *Optical problems related to properties and interactions of laser beams*
42.60K *Optical problems related to applications of laser beams*
42.65 Nonlinear optics
42.65B *General theory*
42.65C *Stimulated Raman, Brillouin and Rayleigh scattering; parametric oscillations and harmonic generation*
42.65F *Phase conjugation*
42.65G *Photon echoes, self-induced transparency, optical saturation and related effects*
42.65J *Beam trapping, self focusing, thermal blooming, and related effects*
42.70 Optical materials
42.70C *Glass*
42.70G *Light-sensitive materials*
42.72 Optical sources and standards
42.78 Optical lens and mirror systems
42.78H *Coatings*
42.80 Optical devices, techniques and applications
42.80B *Spatial filters, zone plates*
42.80C *Spectral and other filters*
42.80D *Monochromators*
42.80E *Shutters, windows, diaphragms, deflectors, choppers*
42.80F *Gratings, echelles*
42.80K *Optical beam modulators*
42.80L *Optical waveguides*
42.80M *Fibre optics*
42.80Q *Image detectors, convertors, and intensifiers*
42.80S *Optical communications devices*
42.82 Integrated optics
42.85 Optical testing and workshop techniques
42.90 Other topics in optics

43.00 ACOUSTICS
43.20 General linear acoustics
43.25 Nonlinear acoustics and macrosonics
43.28 Aeroacoustics and atmospheric sound
43.30 Underwater sound
43.35 Ultransonics, quantum acoustics, and physical effects of sound
43.40 Mechanical vibrations and shock
43.45 Statistical studies of acoustical response
43.50 Noise, its effects and control
43.55 Architectural acoustics
43.60 Acoustic signal processing
43.63 Acoustic holography
43.70 Speech communication
43.75 Music and musical instruments
43.85 Acoustical measurements and instrumentation
43.88 Transduction: devices for the generation and production of sound
43.90 Other topics in acoustics

44.00 HEAT FLOW, THERMAL AND THERMODYNAMIC PROCESSES
44.10 Heat conduction (models, phenomenological description)
44.25 Convective and constrained heat transfer
44.30 Heat transfer in inhomogeneous media and through interfaces
44.40 Radiative heat transfer
44.50 Thermal properties of matter (phenomenology, experimental techniques)
44.60 Thermodynamic processes (phenomenology, experimental techniques)
44.90 Other topics in heat flow, thermal and thermodynamic processes

46.00 MECHANICS, ELASTICITY, RHEOLOGY
46.10 Mechanics of discrete systems
46.20 Continuum mechanics
46.30 Mechanics of solids and rheology
46.30C *Static elasticity*
46.30J *Viscoelasticity, plasticity, viscoplasticity, creep, and stress relaxation*
46.30L *Static buckling and instability*
46.30M *Vibrations, aeroelasticity, hydroelasticity, mechanical waves, and shocks*
46.30N *Fracture mechanics, fatigue, and cracks*
46.30P *Friction, wear, adherence, hardness, mechanical contacts*
46.30R *Measurement methods and techniques*
46.60 Rheology of fluids and pastes
46.90 Other topics in mechanics, elasticity, and rheology

47.00 FLUID DYNAMICS
47.10 General theory
47.15 Laminar flows
47.15C *Laminar boundary layers*
47.15F *Stability of laminar flows*
47.20 Hydrodynamic stability
47.25 Turbulent flows, convection, and heat transfer
47.25C *Isotropic turbulence*
47.25F *Boundary layer and shear turbulence*
47.25J *Turbulent diffusion*
47.25M *Noise (turbulence generated)*
47.25Q *Convection and heat transfer*
47.25R *Wakes*
47.30 Rotational flow and vorticity
47.35 Waves
47.40 Compressible flows; shock and detonation phenomena
47.40D *General subsonic flows*
47.40H *Transonic flows*
47.40K *Supersonic and hypersonic flows*
47.40N *Shock-wave interactions*
47.45 Rarefied gas dynamics
47.50 Non-Newtonian dynamics
47.55 Nonhomogeneous flows
47.55B *Cavitation*
47.55C *Jets*
47.55E *Nozzles*
47.55H *Stratified flows*
47.55K *Multiphase flows*
47.55M *Flow through porous media*
47.60 Flows in ducts, channels, and conduits
47.65 Magnetohydrodynamics and electrohydrodynamics
47.70 Reactive, radiative, or nonequilibrium flows
47.75 Relativistic fluid dynamics
47.80 Instrumentation for fluid dynamics
47.90 Other topics in fluid dynamics

50.00 **FLUIDS, PLASMAS, AND ELECTRIC DISCHARGES**

51.00 KINETIC AND TRANSPORT THEORY OF FLUIDS; PHYSICAL PROPERTIES OF GASES
51.10 Kinetic and transport theory
51.20 Viscosity and diffusion, experimental
51.30 Thermal properties of gases
51.40 Acoustical properties of gases; ultrasonic relaxation
51.50 Electrical phenomena in gases
51.60 Magnetic phenomena in gases
51.70 Optical phenomena in gases
51.90 Other topics in the physics of fluids

52.00 THE PHYSICS OF PLASMAS AND ELECTRIC DISCHARGES
52.20 Elementary processes in plasma
52.20F *Electron collisions*

52.20H *Atomic, molecular, heavy-particle collisions*
52.25 Plasma basic properties
52.25F *Transport properties*
52.25P *Emission, absorption, and scattering of radiation*
52.30 Plasma flow; magnetohydrodynamics
52.35 Waves, oscillations, and instabilities in plasma
52.35R *Plasma turbulence*
52.35T *Shock waves*
52.40 Plasma interactions
52.40D *Electromagnetic wave propagation in plasma*
52.40F *Antennas in plasma; plasma-filled wave guides*
52.40H *Solid–plasma interactions*
52.40K *Sheaths*
52.40M *Beam interactions in plasma*
52.50 Plasma production and heating
52.50J *Plasma production and heating by laser beams*
52.50L *Plasma production and heating by shock wave and wire explosion*
52.55 Plasma equilibrium and confinement
52.60 Relativistic plasma
52.65 Plasma simulation
52.70 Plasma diagnostic techniques and instrumentation
52.75 Plasma devices and applications
52.80 Electric discharges
52.90 Other topics in plasma physics and electric discharges

60.00 **CONDENSED MATTER: STRUCTURE, THERMAL AND MECHANICAL PROPERTIES**

61.00 STRUCTURE OF LIQUIDS AND SOLIDS; CRYSTALLOGRAPHY
61.10 X-ray determination of structures
61.10D *Theories of diffraction and scattering*
61.10F *Experimental techniques*
61.12 Neutron determination of structures
61.14 Electron determination of structures
61.14D *Theories of diffraction and scattering*
61.14F *Experimental diffraction and scattering*
61.14H *Low-energy electron diffraction (LEED) and reflection high-energy electron diffraction (RHEED)*
61.16 Other determination of structures
61.16D *Electron microscopy determinations*
61.16F *Field-ion microscopy determinations*
61.16N *EPR and NMR determinations*
61.20 Classical, semiclassical, and quantum theories of liquid structure
61.25 Studies of specific liquid structures
61.25M *Liquid metals*
61.30 Liquid crystals
61.40 Amorphous and polymeric materials
61.40D *Glasses*
61.40K *Polymers, elastomers, and plastics*
61.50 Crystalline state
61.50C *Physics of crystal growth*
61.50E *Crystal symmetry; models and space groups, and crystalline systems and classes*
61.50J *Crystal morphology and orientation*
61.50K *Crystallographic aspects of polymorphic and order–disorder transformations*
61.50L *Crystal binding*
61.55 Specific structure of elements and alloys
61.55D *Nonmetallic elements*
61.55F *Metallic elements*
61.55H *Alloys*
61.60 Specific structure of inorganic compounds
61.65 Specific structure of organic compounds
61.70 Defects in crystals
61.70B *Interstitials and vacancies*
61.70D *Colour centres*
61.70E *Other point defects*
61.70G *Dislocations: theory*
61.70J *Etch pits, decoration, transmission electron-microscopy and other direct observations of dislocations*
61.70L *Slip, creep, internal friction and other indirect evidence of dislocations*
61.70N *Grain and twin boundaries*
61.70P *Stacking faults, stacking fault tetrahedra, and other planar or extended defects*
61.70R *Crystal impurities: general*
61.70T *Doping and implantation of impurities*
61.70W *Impurity concentration, distribution, and gradients*
61.70Y *Interaction between different crystal structure defects*
61.80 Radiation damage and other irradiation effects
61.80B *Laser beams*
61.80C *X-rays*
61.80E *Gamma rays*
61.80F *Electrons and positrons*
61.80H *Neutrons*
61.80J *Ions*
61.80L *Atoms and molecules*
61.80M *Channelling, blocking and energy loss of particles*
61.90 Other topics in structure of liquids and solids

62.00 MECHANICAL AND ACOUSTIC PROPERTIES OF CONDENSED MATTER
62.10 Mechanical properties of liquids
62.20 Mechanical properties of solids (related to microscopic structure)
62.20D *Elastic constants*
62.20F *Deformation and plasticity*
62.20H *Creep*
62.20M *Fatigue, brittleness, fracture, and cracks*
62.20P *Tribology*
62.30 Mechanical and elastic waves
62.40 Anelasticity, internal friction, and damping
62.50 High-pressure and shock-wave effects in solids
62.60 Acoustic properties of liquids
62.65 Acoustic properties of solids
62.80 Ultrasonic relaxation
62.90 Other topics in mechanical and acoustical properties of condensed matter

63.00 LATTICE DYNAMICS AND CRYSTAL STATISTICS
63.10 General theory
63.20 Phonons and vibrations in crystal lattices
63.20D *Phonon states and bands, normal modes, and phonon dispersion*
63.20H *Phonon–phonon interactions*
63.20K *Phonon–electron interactions*
63.20M *Phonon–defect interactions*
63.20P *Localized modes*
63.50 Vibrational states in disordered systems
63.70 Statistical mechanics of lattice vibrations
63.75 Statistical mechanics of displacive phase-transitions
63.90 Other topics in lattice dynamics and crystal statistics

64.00 EQUATIONS OF STATE, PHASE EQUILIBRIA, AND PHASE TRANSITIONS
64.10 General theory of equations of state and phase equilibria
64.30 Equations of state of specific substances
64.60 General studies of phase transitions
64.70 Phase equilibria, phase transitions, and critical points
64.70D *Solid–liquid transitions*
64.70F *Liquid–vapour transitions*

64.70H *Solid–vapour transitions*
64.70J *Liquid–liquid transitions*
64.70K *Solid–solid transitions*
64.70M *Transitions in liquid crystals*
64.70P *Glass transitions*
64.75 Solubility, segregation, and mixing
64.80 Other phase properties of systems
64.90 Other topics in equations of state, phase equilibria, and phase transitions

65.00 THERMAL PROPERTIES OF CONDENSED MATTER
65.20 Heat capacities of liquids
65.40 Heat capacities of solids
65.50 Thermodynamic properties and entropy
65.70 Thermal expansion and thermomechanical effects
65.90 Other topics in thermal properties of condensed matter

66.00 TRANSPORT PROPERTIES OF CONDENSED MATTER (NONELECTRONIC)
66.10 Diffusion and ionic conduction in liquids
66.20 Diffusive momentum transport
66.30 Diffusion in solids
66.30D *Theory of diffusion and ionic conduction in solids*
66.30F *Self-diffusion in metals, semimetals, and alloys*
66.30H *Self-diffusion and ionic conduction in nonmetals*
66.30J *Diffusion, migration, and displacement of impurities*
66.30L *Diffusion, migration, and displacement of other defects*
66.30N *Chemical interdiffusion*
66.30Q *Electromigration*
66.60 Thermal conduction in nonmetallic liquids
66.70 Nonelectronic thermal conduction and heat-pulse propagation in nonmetallic solids
66.90 Other topics in nonelectronic transport properties

67.00 QUANTUM FLUIDS AND SOLIDS: LIQUID AND SOLID HELIUM
67.20 Quantum effects on the structure and dynamics of nondegenerate fluids
67.40 Boson degeneracy and superfluidity of helium-4
67.50 Fermi fluids; liquid helium-3
67.60 Mixed systems; liquid helium3-4 mixtures
67.70 Films
67.80 Solid helium and related quantum crystals
67.90 Other topics in quantum fluids and solids (e.g. neutron-star matter)

68.00 SURFACES AND INTERFACES: THIN FILMS AND WHISKERS
68.10 Fluid surfaces and interfaces with fluids
68.15 Liquid thin films
68.20 Solid surface structure
68.25 Mechanical and acoustical properties of solid surfaces and interfaces
68.30 Dynamics of solid surfaces and interface vibrations
68.40 Surface energy of solid; thermodynamic properties
68.45 Solid–fluid interface processes
68.48 Solid–solid interfaces
68.55 Thin film growth, structure, and epitaxy
68.60 Physical properties of thin films, nonelectronic
68.70 Whiskers and dendrites: growth, structure, and nonelectronic properties
68.90 Other topics in the structure and nonelectronic properties of surfaces and thin films

70.00 **CONDENSED MATTER: ELECTRONIC STRUCTURE, ELECTRICAL, MAGNETIC, AND OPTICAL PROPERTIES**

71.00 ELECTRON STATES
71.10 General theories and computational techniques
71.20 Electronic density of states determinations
71.25 Nonlocalized single-particle electronic states
71.25C *Techniques of band-structure calculation (general theory, applications of group theory, analytic continuation, etc.)*
71.25H *Measurement of Fermi surface parameters*
71.25J *Effective mass and g-factors*
71.25L *Electron energy states in liquid metals*
71.25M *Electron energy states in amorphous and glassy solids*
71.25P *Band structure of crystalline metals*
71.25R *Band structure of crystalline elemental semiconductors*
71.25T *Band structure of crystalline semiconductor compounds and insulators*
71.30 Metal–insulator transitions
71.35 Excitons and related phenomena
71.36 Polaritons
71.38 Polarons and electron–phonon interactions
71.45 Collective effects
71.45G *Exchange, correlation, dielectric and magnetic functions, plasmons*
71.45J *Fermi–Thomas model*
71.45N *Calculations of total electronic binding energy*
71.50 Localized single-particle electronic states
71.55 Impurity and defect levels
71.55J *Localization in disordered structures*
71.65 Positron states
71.70 Level splitting and interactions
71.70C *Crystal and ligand fields*
71.70E *Spin-orbit coupling, Zeeman, Stark, and strain splitting*
71.70G *Exchange interactions*
71.70J *Nuclear states and interactions*
71.90 Other topics in electron states

72.00 ELECTRONIC TRANSPORT IN CONDENSED MATTER
72.10 Theory of electronic transport; scattering mechanisms
72.15 Electronic conduction in metals and alloys
72.15C *Electrical and thermal conduction in amorphous and liquid metals and alloys*
72.15E *Electrical and thermal conduction in crystalline metals and alloys*
72.15G *Galvanomagnetic and other magnetotransport effects*
72.15H *Thermomagnetic effects*
72.15J *Thermoelectric effects*
72.15L *Relaxation times and mean free paths*
72.15N *Collective modes; e.g. in one-dimensional conductors*
72.15Q *Scattering mechanisms and Kondo effect*
72.20 Conductivity phenomena in semiconductors and insulators
72.20D *General theory, scattering mechanisms*
72.20F *Low-field transport and mobility; piezoresistance*
72.20H *High-field and nonlinear effects*
72.20J *Charge carriers: generation, recombination, lifetime, and trapping*
72.20M *Galvanomagnetic and other magnetotransport effects*
72.20N *Thermomagnetic effects*
72.20P *Thermoelectric effects*
72.30 High-frequency effects; plasma effects
72.40 Photoconduction and photovoltaic effects; photodielectric effects
72.50 Acoustoelectric effects
72.55 Magnetoacoustic effects
72.60 Mixed conductivity and conductivity transitions

72.70 Noise processes and phenomena
72.80 Conductivity of specific semiconductors and insulators
72.80C *Elemental semiconductors*
72.80E *III-V and II-VI semiconductors*
72.80G *Transition-metal compounds*
72.80J *Other crystalline inorganic semiconductors*
72.80L *Organic semiconductors*
72.80N *Amorphous and glassy semiconductors*
72.80P *Liquid semiconductors*
72.90 Other topics in electronic transport in condensed matter

73.00 ELECTRONIC STRUCTURE AND ELECTRICAL PROPERTIES OF SURFACES, INTERFACES, AND THIN FILMS
73.20 Electronic surface states
73.25 Surface conductivity
73.30 Surface double layers, Schottky barriers, and work functions
73.40 Interfaces
73.40B *Static electrification*
73.40G *Tunnelling, general*
73.40J *Metal-to-metal contacts*
73.40L *Semiconductor-to-semiconductor contacts, p–n junctions, and heterojunctions*
73.40M *Semiconductor–electrolyte contacts*
73.40N *Metal–nonmetal contacts*
73.40Q *Metal–insulator–semiconductor structures*
73.40R *Metal–insulator–metal structures*
73.40S *Metal–semiconductor–metal structures*
73.60 Electronic properties of thin films
73.60D *Metallic thin films*
73.60F *Semiconductor films*
73.60H *Insulating thin films*
73.60K *Superconducting films*
73.90 Other topics in electrical properties of surfaces, interfaces, and thin films

74.00 SUPERCONDUCTIVITY
74.10 Occurrence, critical temperature
74.20 Theory
74.20F *BCS theory and its applications*
74.30 General properties
74.30C *Magnetization curves, Meissner effect, penetration depth*
74.30E *Thermodynamic properties; thermal conductivity*
74.30G *Response to electromagnetic fields, nuclear magnetic resonance, ultrasonic attenuation*
74.40 Fluctuations and critical effects
74.50 Proximity effects, tunnelling phenomena, and Josephson effect
74.55 Type-I superconductivity
74.60 Type-II superconductivity
74.60E *Mixed state, H_{c2} surface sheath*
74.60G *Flux pinning; fluxon–defect interactions*
74.60J *Critical currents*
74.70 Superconducting materials
74.70D *Material effects on T_c, K, critical currents*
74.70G *Type-I superconductors (non-transition metals)*
74.70L *Type-II superconductors (transition metals, alloys and compounds)*
74.70N *Dirty superconductors*
74.70P *Materials for high-field applications*
74.90 Other topics in superconductivity

75.00 MAGNETIC PROPERTIES AND MATERIALS
75.10 General theory and models of magnetic ordering
75.10D *Crystal-field theory and spin Hamiltonians*
75.10H *Ising and other classical spin models*
75.10J *Heisenberg and other quantized localized spin models*
75.10L *Band and itinerant models*
75.20 Diamagnetism and paramagnetism
75.20C *Nonmetals*
75.20E *Metals and alloys*
75.20H *Local moment in dilute alloys; Kondo effect*
75.25 Spin arrangements in magnetically ordered materials (neutron studies, etc.)
75.30 Magnetically ordered materials, other intrinsic properties
75.30C *Saturation moments and magnetic susceptibility*
75.30D *Spin waves*
75.30E *Exchange and superexchange interactions*
75.30G *Anisotropy*
75.30H *Magnetic impurity interactions*
75.30K *Magnetic phase boundaries*
75.30S *Magnetocaloric effect*
75.40 Critical-point effects, specific heats, short-range order
75.40D *Ising and other classical spin models*
75.40F *Heisenberg and other quantized spin models*
75.50 Studies of specific magnetic materials
75.50B *Ferromagnetism of Fe and its alloys*
75.50C *Ferromagnetism of other metals*
75.50D *Ferromagnetism of nonmetals*
75.50E *Antiferromagnetics*
75.50G *Ferrimagnetics*
75.50K *Amorphous magnetic materials*
75.50M *Magnetic liquids*
75.60 Domain effects, magnetization curves, and hysteresis
75.60C *Domain walls and domain structure*
75.60E *Magnetization curves, hysteresis, Barkhausen and related effects*
75.60G *High coercivity materials*
75.60J *Fine-particle systems*
75.60L *Magnetic aftereffects*
75.60N *Magnetic annealing and temperature-hysteresis effects*
75.70 Magnetic films and plates
75.70K *Domain structure (magnetic bubbles)*
75.80 Magnetomechanical and magnetoelectric effects, magnetostriction
75.90 Other topics in magnetic properties and materials

76.00 MAGNETIC RESONANCES AND RELAXATION IN CONDENSED MATTER: MOSSBAUER EFFECT
76.20 General theory of resonances and relaxation
76.30 Electron paramagnetic resonance and relaxation
76.30D *Ions and impurities: general*
76.30F *Iron group (3d) ions and impurities (Ti–Cu)*
76.30H *Platinum and palladium group (4d and 5d) ions and impurities (Zr–Ag and Hf–Au)*
76.30K *Rare-earth ions and impurities*
76.30L *Other ions and impurities*
76.30M *Colour centres and other defects*
76.30P *Conduction electrons*
76.30R *Free radicals*
76.40 Diamagnetic and cyclotron resonances
76.50 Ferromagnetic, antiferromagnetic, and ferrimagnetic resonances; spin wave resonance
76.60 Nuclear magnetic resonance and relaxation
76.60C *Chemical and Knight shifts*
76.60E *Relaxation effects*
76.60G *Quadrupole resonance*
76.60L *Spin echoes*
76.70 Magnetic double resonances and cross effects
76.70D *Electron-nuclear double resonance (ENDOR)*
76.70E *Dynamical nuclear polarization*
76.70F *Double nuclear magnetic resonance (DNMR)*
76.70H *Optical double magnetic resonance (ODMR)*
76.70K *Electron double resonance (ELDOR)*

76.80 Mossbauer effect; other gamma-ray spectroscopy
76.90 Other topics in magnetic resonances and relaxation

77.00 DIELECTRIC PROPERTIES AND MATERIALS
77.20 Permittivity
77.30 Polarization and depolarization effects
77.40 Dielectric loss and relaxation
77.50 Dielectric breakdown and space-charge effects
77.55 Dielectric thin films
77.60 Piezoelectricity and electrostriction
77.70 Pyroelectric and electrocaloric effects
77.80 Ferroelectricity and antiferroelectricity
77.80B *Transitions and Curie point*
77.80D *Domain structure and effects; hysteresis*
77.85 Electrical resonances
77.90 Other topics in dielectric properties and materials

78.00 OPTICAL PROPERTIES AND CONDENSED MATTER SPECTROSCOPY AND OTHER INTERACTIONS OF MATTER WITH PARTICLES AND RADIATION
78.20 Optical properties and materials
78.20B *General theory (for pure homogeneous materials)*
78.20D *Optical constants and parameters*
78.20E *Optical rotatory power*
78.20F *Birefringence*
78.20H *Piezo-, elasto- and acousto-optical effects*
78.20J *Electro-optical effects*
78.20L *Magneto-optical effects*
78.20N *Thermo-optical effects*
78.30 Infrared and Raman spectra and scattering
78.35 Brillouin and Rayleigh scattering
78.40 Visible and ultraviolet spectra
78.45 Stimulated emission
78.50 Impurity and defect absorption in solids
78.55 Photoluminescence
78.60 Other luminescence spectra and radiative recombination
78.60F *Electroluminescence*
78.60H *Cathodoluminescence, ionoluminescence*
78.60K *Thermoluminescence*
78.60M *Sonoluminescence, triboluminescence*
78.60P *Chemiluminescence*
78.65 Optical properties of thin films
78.70 Other interactions of matter with particles and radiation
78.70B *Positron annihilation*
78.70C *X-ray scattering*
78.70D *X-ray absorption and absorption edges*
78.70E *X-ray emission threshold and fluorescence*
78.70G *Microwave and radiofrequency spectra*
78.90 Other topics in optical properties of condensed matter and other interactions of matter with particles

79.00 ELECTRON AND ION EMISSION BY LIQUIDS AND SOLIDS: IMPACT PHENOMENA
79.20 Impact phenomena
79.20D *Laser-light impact phenomena*
79.20F *Electron impact: Auger emission*
79.20H *Electron impact: secondary emission*
79.20K *Other electron impact phenomena*
79.20N *Atom, molecule, and ion impact*
79.20R *Atomic and molecular beam interactions*
79.40 Thermionic emission
79.60 Photoemission and photoelectron spectra
79.70 Field emission and field ionization
79.75 Exoelectron emission
79.80 Resonance tunnelling
79.90 Other topics in emission and impact phenomena in condensed matter

80.00 **CROSS-DISCIPLINARY PHYSICS AND RELATED AREAS OF SCIENCE AND TECHNOLOGY**

81.00 MATERIALS SCIENCE
81.10 Methods of crystal growth and purification
81.10B *Growth from vapour*
81.10D *Growth from solutions*
81.10F *Growth from melts*
81.10H *Zone melting and zone refining*
81.10J *Growth from solid phases*
81.15 Methods of thin film depositions
81.15C *Deposition by cathodic sputtering*
81.15G *Vacuum deposition*
81.15H *Chemical vapour deposition*
81.15J *Ion plating and other vapour deposition*
81.15L *Deposition from liquid phases (melts and solutions)*
81.20 Other methods of preparation of materials
81.20C *Vacuum methods*
81.20E *Powder techniques, compaction and sintering*
81.20G *Specific metals and alloys (compacts, pseudoalloys)*
81.20J *Dispersion-, fibre- and platelet-reinforced metal-based composites*
81.20L *Ceramics and refractories*
81.20N *Cermets, ceramic and refractory composites*
81.20P *Glasses*
81.20Q *Glass-based composites, vitroceramics*
81.20S *Polymers*
81.20T *Reinforced polymers and polymer-based composites*
81.30 Phase diagrams and microstructures developed by solidification and solid–solid phase transformations
81.30B *Phase diagrams of metals and alloys*
81.30D *Phase diagrams of other materials*
81.30F *Solidification*
81.30H *Constant-composition solid–solid phase transformations: polymorphic, massive, order–disorder*
81.30K *Martensitic transformations*
81.30M *Precipitation*
81.40 Treatment of materials and its effects on microstructures and properties
81.40C *Solid solution hardening, precipitation hardening, dispersion hardening*
81.40E *Cold working, work hardening; annealing, recovery and recrystallisation; textures*
81.40G *Other heat and thermomechanical treatments*
81.40J *Elasticity and anelasticity*
81.40L *Deformation, plasticity and creep*
81.40N *Fatigue, embrittlement, and fracture*
81.40P *Friction, lubrication, and wear*
81.40R *Electrical and magnetic properties (related to treatment conditions)*
81.40T *Optical properties (related to treatment conditions)*
81.60 Corrosion, oxidation and surface treatments
81.60B *Metals and alloys*
81.70 Materials testing
81.90 Other topics in materials science

82.00 PHYSICAL CHEMISTRY
82.20 Chemical kinetics
82.20K *Potential energy surfaces for chemical reactions*
82.20M *Nonequilibrium kinetics*
82.20R *Energy distribution and transfer, relaxation*
82.30 Specific chemical reactions; reaction mechanisms
82.35 Polymer reactions and polymerization
82.40 Chemical kinetics and reactions: special regimes
82.40D *Atomic and molecular beam reactions*

82.40T *Chemiluminescence and chemical laser kinetics*
82.45 Electrochemistry and electrophoresis
82.50 Photochemistry and radiation chemistry
82.50E *Photodissociation, photoionization as studied by luminescence and radiationless transitions*
82.55 Radiochemistry
82.60 Chemical thermodynamics
82.65 Surface processes
82.70 Disperse systems
82.80 Chemical analysis and related physical methods of analysis
82.90 Other topics in physical chemistry

86.00 ENERGY RESEARCH AND ENVIRONMENTAL SCIENCE
86.10 Energy resources and their utilisation
86.10B *Fossil and other fuels*
86.10D *Wind energy*
86.10F *Tidal and flow energy*
86.10H *Geothermal energy*
86.10K *Solar energy*
86.10N *Nuclear energy*
86.10Z *Other topics*
86.30 Energy conversion
86.30D *Electrochemical conversion: general*
86.30E *Primary cells*
86.30F *Secondary cells*
86.30G *Fuel cells*
86.30J *Photoelectric conversion: solar cells and arrays*
86.30K *Photoelectrochemical conversion*
86.30L *Electrogasdynamic and magnetohydrodynamic conversion*
86.30M *Thermoelectric conversion*
86.30N *Thermionic conversion*
86.30P *Photosynthesis*
86.30Q *Chemical energy conversion*
86.30R *Thermal energy conversion (heat engines and heat pumps)*
86.30S *Photothermal conversion*
86.30Z *Other topics*
86.40 Energy storage (secondary energy)
86.40C *Storage in mechanical energy*
86.40F *Storage in thermal energy*
86.40H *Storage in chemical energy*
86.40K *Hydrogen storage and technology*
86.40Z *Other topics*
86.60 Requirement for energy: ecological aspects
86.70 Environmental science
86.70C *Soil*
86.70E *Water*
86.70G *Atmosphere*
86.70J *Noise*
86.70L *Measurement techniques in environmental science*
86.70Z *Other topics*
86.90 Other topics in energy research and environmental science

87.00 BIOPHYSICS, MEDICAL PHYSICS, AND BIOMEDICAL ENGINEERING
87.10 General, theoretical, and mathematical biophysics
87.15 Molecular biophysics
87.15B *Structure, configuration, conformation, and active sites at the biomolecular level*
87.15M *Interactions with radiations at the biomolecular level*
87.16 Biothermics
87.20 Membrane biophysics
87.25 Cellular biophysics
87.25D *Biological transport; cellular and subcellular transmembrane physics*
87.30 Biophysics of neurophysiological processes
87.32 Physiological optics, vision
87.32C *Anatomy and optics of the eye*
87.32E *Physiology of the eye; nerve structure and function*
87.32L *Light detection; adaptation and discrimination*
87.32N *Colour detection; adaptation and discrimination*
87.32S *Psychophysics of vision, visual perception, binocular vision*
87.34 Audition
87.36 Speech
87.38 Mechano- and chemio-ceptions
87.40 Biomagnetism
87.45 Biomechanics, biorheology, biological fluid dynamics
87.50 Biological effects of radiations
87.50B *Interactions of biosystems with radiations*
87.50C *Bioacoustics (sonic and ultrasonic effects on living matter)*
87.50E *Bio-optics (effects of microwaves, light, laser and other electromagnetic waves)*
87.50G *Ionizing radiations (u.v., X-ray, gamma-ray; particle radiation effects)*
87.60 Medical and biomedical uses of fields, radiations, and radioactivity
87.60B *Sonic and ultrasonic radiation*
87.60D *Electric and magnetic fields (d.c. and pulsed)*
87.60G *Laser beams, microwaves, and other electromagnetic waves*
87.60J *Corpuscular radiation and radioisotopes*
87.60L *Preparation of radioactive materials for medical and biomedical uses*
87.60M *Radiation dosimetry*
87.60P *Radiation protection*
87.60R *Radioactive pollution*
87.65 Aerospace biophysics and medical physics (effects of accelerations, weightlessness and environment)
87.70 Biomedical engineering
87.70E *Diagnostic methods and instrumentation*
87.70G *Patient care and treatment*
87.70J *Prosthetics and other practical applications*
87.80 Biophysical instrumentation and techniques
87.90 Other topics in biophysics, medical physics, and biomedical engineering

90.00 **GEOPHYSICS, ASTRONOMY AND ASTROPHYSICS**

91.00 SOLID EARTH GEOPHYSICS
91.10 Geodesy and gravity
91.25 Geomagnetism and palaeomagnetism; geoelectricity
91.30 Seismology
91.35 Earth's interior structure and properties
91.40 Volcanology
91.45 Physics of plate tectonics
91.50 Marine geology and geophysics
91.60 Physical properties of rocks and minerals
91.65 Geophysical aspects of geology, mineralogy and petrology
91.90 Other topics in solid Earth geophysics

92.00 HYDROSPHERIC AND ATMOSPHERIC GEOPHYSICS
92.10 Physics of the oceans
92.20 Interdisciplinary aspects of oceanography
92.40 Hydrology and glaciology
92.60 Meteorology
92.60S *Climatology*
92.65 Atmospheric optics
92.90 Other topics in hydrospheric and atmospheric geophysics

93.00 GEOPHYSICAL OBSERVATIONS, INSTRUMENTATION, AND TECHNIQUES
93.30 Information related to geographical regions
93.55 International organizations, national and international programs
93.65 Data acquisition and storage
93.85 Instrumentation and techniques for geophysical research

94.00 AERONOMY AND SPACE PHYSICS
94.10 Physics of the neutral atmosphere
94.10Q *Airglow and nightglow*
94.10S *Aurora*
94.20 Physics of the ionosphere
94.30 Physics of the magnetosphere
94.40 Cosmic rays
94.40C *Origin and propagation outside the solar system*
94.40E *Interplanetary propagation and effects*
94.40H *Energetic solar particles and photons*
94.40K *Solar modulation and geophysical effects*
94.40L *Composition and energy spectra*
94.40N *Extensive air showers*
94.40R *High-energy interactions*
94.40T *Muons and neutrinos*
94.40V *Cosmic-ray effects in meteorites and terrestrial matter*
94.60 Interplanetary space
94.80 Aerospace facilities and techniques; space research
94.90 Other topics in space physics

95.00 FUNDAMENTAL ASTRONOMY AND ASTROPHYSICS, INSTRUMENTATION AND TECHNIQUES AND ASTRONOMICAL OBSERVATIONS
95.10 Fundamental astronomy
95.10C *Celestial mechanics*
95.30 Fundamental aspects of astrophysics
95.45 Observatories
95.55 Astronomical instruments
95.65 Auxiliary and recording instruments
95.70 Other instrumentation and techniques
95.75 Techniques of observation and reduction
95.80 Astronomical observations (listed by techniques of observation)
95.80D *Radio and radar*
95.80G *Far infrared (bolometric, photoconductive)*
95.80J *Photographic region (near infrared, visible, and normal ultraviolet)*
95.80M *Space ultraviolet*
95.80N *X-ray*
95.80Q *Gamma-ray and elementary particle*
95.80S *Other (including gravitational radiation, magnetograms, etc.)*
95.85 Catalogues, atlases, etc.
95.90 Other topics in astronomy and astrophysics

96.00 SOLAR SYSTEM
96.10 General, solar nebula, and cosmogony
96.20 Moon
96.30 Planets and satellites
96.30D *Mercury*
96.30E *Venus*
96.30G *Mars*
96.30H *Asteroids*
96.30K *Jupiter*
96.30M *Saturn*
96.30T *Other planets*
96.50 Other objects in the planetary system
96.50D *Interplanetary matter, magnetic and electric fields*
96.50G *Comets*
96.50K *Meteors, showers, and meteoroids*
96.50M *Meteorites, micrometeorites*
96.60 Solar physics
96.90 Other topics on the solar system

97.00 STARS
97.10 Stellar characteristics
97.20 Normal stars (by class): general or individual
97.30 Variable and peculiar stars
97.60 Late stage of stellar evolution
97.60B *Supernovae*
97.60G *Pulsars*
97.60J *Neutron stars*
97.60L *Black holes*
97.80 Binary and multiple stars
97.90 Other topics in stellar astronomy

98.00 STELLAR SYSTEMS: GALACTIC AND EXTRAGALACTIC OBJECTS AND SYSTEMS; THE UNIVERSE
98.10 Stellar dynamics
98.20 Stellar clusters and associations
98.40 Interstellar matter; and nebulae
98.50 The Galaxy, extragalactic objects and systems
98.50K *Groups, clusters, superclusters*
98.70 Other objects and background radiations of unknown origin and distances
98.70D *Discrete radio sources*
98.70J *Quasars*
98.70L *IR sources*
98.70Q *X-ray and gamma-ray sources*
98.70S *Cosmic ray sources*
98.70V *Background radiations*
98.80 Cosmology
98.90 Other topics in galactic and extragalactic astronomy

00.00 GENERAL

02.00 MATHEMATICAL METHODS IN PHYSICS

Erratum: Comments on tensor analysis in generalized spacetimes. Mann, R.B., 383.

02.90 Other topics in mathematical methods in physics

Racah algebra for the double trigonal group. Lulek, B., Lulek, T., and Chatterjee, R., 927.

03.65 Quantum theory; quantum mechanics

Scattering length and effective range for the Coulomb plus separable potential. Nogami, Y., and van Dijk, W., 205.
On the logarithmic perturbation theory for screened Coulomb potentials. Lai, C.S., 365.

03.70 Theory of quantized fields

Dependence on the renormalization points in a simple scalar theory. McKeon, G., 789.

03.80 General theory of scattering

A note on bounds to central potential scattering parameters. Darewych, J.W., 1075.
Bäcklund transformation according to Gerdzikov and Kullish for the Korteweg–de Vries equation. Gautrin, H.-F., 1599.

04.20 General relativity

Erratum: Equivalence principle for charged bodies in a theory of gravitation. Mann, R.B., and Moffat, J.W., 383.
Event horizon area in a slowly changing Weyl geometry. Brumbaugh, B.E., and Price, R.H., 1155.
Equivalence principle for massive bodies in a generalized theory of gravitation. I. McDow, J.C., and Moffat, J.W., 1545.
Equivalence principle for massive bodies in a generalized theory of gravitation. II. McDow, J.C., and Moffat, J.W., 1556.

04.50 Unified field theories and other theories of gravitation

The early universe in a generalized theory of gravitation. Moffat, J.W., and Vincent, D., 659.

04.80 Experimental tests of general relativity and observations of gravitational radiation

Equivalence principle for massive bodies in a generalized theory of gravitation. II. McDow, J.C., and Moffat, J.W., 1556.

04.90 Other topics in relativity and gravitation

Erratum: Comments on tensor analysis in generalized spacetimes. Mann, R.B., 383.

05.30 Quantum statistical mechanics

Order–disorder phase transition in FeAl alloys by neutron diffraction. Ahmed, N., Butt, N.M., Beg, M.M., Aslam, J., Khan, Q.H., and Collins, M.F., 1323.

06.30 Measurement of basic variables

On the light shift in optical pumping of rubidium 87: the techniques of "separated" and "integrated" hyperfine filtering. Vanier, J., Kunski, R., Paulin, P., Têtu, M., and Cyr, N., 1396.
Optical measurements of vapor pressures of Rb and a Rb–K mixture. Thompson, D.C., and Xu, G.-X., 1496.

06.60 Laboratory techniques

Phonon echo technique applied to adsorption isotherm measurement. Poirier, M., and Cheeke, J.D.N., 1053.

07.55 Magnetic instruments and techniques

Spatial discrimination in SQUID gradiometers and 3rd order gradiometer performance. Vrba, J., Fife, A.A., Burbank, M.B., Weinberg, H., and Brickett, P.A., 1060.

07.85 X-ray, gamma-ray instruments and techniques

On a mosaic graphite spectrometer without collimators. Koumelis, C.N., Londos, C.A., Kavogli, Z.I., Leventouri, D.K., Vassilikou, A.B., and Zardas, G.E., 1241.

10.00 THE PHYSICS OF ELEMENTARY PARTICLES AND FIELDS

11.10 Field theory

Dependence on the renormalization points in a simple scalar theory. McKeon, G., 789.
The anomalous mass dimension to two loops in quantum chromodynamics. Phillips, S., 793.
Dynamical derivation of the Yang–Mills S-matrix. Pugh, R.E., 1630.

11.20 S-matrix theory

Dimensional reduction and background field quantization. McKeon, G., 1429.

12.20 Unified and electromagnetic interaction theories

Positronium and quantum electrodynamics. Gidley, D.W., 543.
Non-leading mass effects in the effective weak Hamiltonian for $\Delta c = 1$ decays. McKeon, G., 1163.
The optical activity of intergalactic space. Clarke, J.N., Karl, G., and Watson, P.J.S., 1561.

$e^+e^- \rightarrow e$ + heavy lepton by one photon exchange. Resnick, L., 1682.

12.30 Models of weak interactions

$e^+e^- \rightarrow e$ + heavy lepton by one photon exchange. Resnick, L., 1682.

12.40 Models of strong interactions

The cloudy bag model. IV. Pionic corrections to the nucleon properties. Théberge, S., Miller, G.A., and Thomas, A.W., 59.

The quark–gluon phase in strong interacting matter. Gagnon, R., 797.

Single particle inclusive leptoproduction in quantum chromodynamics. Campbell, B.A., 939.

Inclusive cross sections, in the central region, in terms of a Pomeron which saturates the Froissart bound. Georgalas, C.G., and Papargyropoulos, P.H., 950.

13.10 Weak and electromagnetic interactions of leptons

$e^+e^- \rightarrow e$ + heavy lepton by one photon exchange. Resnick, L., 1682.

13.25 Hadronic decays of mesons

Strangeness-changing nonlepton decays of the kaons, hyperons, and the Ω^- particle. Lee, H.C., and Winterbon, K.B., 405.

13.40 Electromagnetic processes and properties

The cloudy bag model. IV. Pionic corrections to the nucleon properties. Théberge, S., Miller, G.A., and Thomas, A.W., 59.

13.85 Hadron-induced high- and super-high-energy interactions, (energy 10 GeV)

Some characteristics of the medium energy particles produced in $\bar{\pi}$-nucleus collisions. Khan, A.R., Ali, U., Ahmad, A., Ahmad, S., Irfan, M., Zafar, M., and Shafi, M., 668.

Comparative study of momentum and rapidity spectra of pions produced in hadron–nucleon and hadron-nucleus collisions. Kaur, M., and Kohli, J.M., 802.

Study of multiparticle rapidity clustering in hadronic interaction at 70 GeV/c. Ghosh, D., Roy, J., Naha, S., Basu, M., and Sengupta, K., 805.

A study of particle–nucleus collisions at 24, 50, and 400 GeV/c. Khushnood, H., Irfan, M., Zafar, M., Ahmad, A., Khan, A.R., Ahmad, S., Ali, U., and Shafi, M., 1523.

20.00 NUCLEAR PHYSICS

A 20 MeV (p,d) study of nuclear structure in the even and odd tin isotopes. Fleming, D.G., 428.

21.10 General and average properties of nuclei; properties of nuclear energy levels

On the quenching of the spin flip excitation strength due to the isobar–hole excitation process. Kohno, M., and Sprung, D.W.L., 1193.

Nuclear level densities. Haq, R.U., and Wong, S.S.M., 1502.

21.60 Nuclear-structure models and methods

Irrotational core in deformed nuclei. Bishara, B.A., 337.

Single-particle currents in the cranked harmonic oscillator model. Habeeb, M.A.Z., and Aziz, A.R.K., 809.

Nuclear level densities. Haq, R.U., and Wong, S.S.M., 1502.

Octupole resonance states in the nucleus oxygen 16. Nash, G.F., 1607.

23.20 Electromagnetic transitions

On the quenching of the spin flip excitation strength due to the isobar–hole excitation process. Kohno, M., and Sprung, D.W.L., 1193.

Mean life predictions in respect of $K^\pi = 2^+$ collective excitations in deformed even nuclei. Varshney, V.P., Gupta, K.K., Chaubey, A.K., and Gupta, D.K., 1461.

23.40 beta decay; electron and muon capture

The effects of ground state correlations in ^{16}O on the muonuclear sum rule. Duplain, D., and Goulard, B., 321.

The half-life of ^{176}Lu by a γ–γ coincidence measurement. Sguigna, A.P., Larabee, A.J., and Waddington, J.C., 361.

24.10 Nuclear reaction and scattering models and methods

Scattering length and effective range for the Coulomb plus separable potential. Nogami, Y., and van Dijk, W., 205.

On the geometric nature of high energy nucleus–nucleus reaction cross sections. Townsend, L.W., Wilson, J.W., and Bidasaria, H.B., 1514.

24.30 Resonance reactions and scattering

Isospin impurity and core polarization of $g_{9/2}$ IAR fragments in ^{59}Cu. Szöghy, I.M., and Rangarcharyulu, C., 959.

24.70 Polarization in reactions and scattering

The half-life of ^{176}Lu by a γ–γ coincidence measurement. Sguigna, A.P., Larabee, A.J., and Waddington, J.C., 361.

Levels in ^{145}Nd studied with the (d, t) reaction. Ardal, J., Lien, J.R., Lovhoiden, G., Burke, D.G., and Waddington, J.C., 1534.

24.75 General properties of fission

Prescission dissipation in nuclear fission from a microscopic point of view. Fontaine, M., and Amiot, P., 279.

25.10 Nuclear reactions and scattering involving few-nucleon systems

The N–P final state interaction in the $^{2}H(d,np)^{2}H$ reaction at 12 MeV. Jeremie, H., Lessard, L., Gujrathi, S., and Zeitnitz, B., 1616.

25.20 Photonuclear reactions and photon scattering

Deuteron photoabsorption sum rule: Two-body effects. Goulard, G., and Lorazo, B., 162.

Cross section of the reaction $^{9}Be(\gamma, n)$ near threshold. Fujishiro, M., Tabata, T., Okamoto, K., and Tsujimoto, T., 1672.

25.30 Lepton-induced reactions and scattering

Electroproduction of low energy π^{+} from ^{3}He. Sealock, R.M., Caplan, H.S., Zulkoskey, B.W., Szyjewicz, A., and Tomusiak, E.L., 1257.

25.40 Nucleon-induced reactions and scattering

Gamma decay of $d_{5/2}$ isobaric analogue resonances in the $^{64}Zn(p,\gamma)$ reaction. Rangacharyulu, C., Chatterjee, M.B., Pruneau, C., and St-Pierre, C., 815.

25.50 ^{2}H- and ^{3}H-induced reactions and scattering

Levels in ^{145}Nd studied with the (d, t) reaction. Ardal, J., Lien, J.R., Lovhoiden, G., Burke, D.G., and Waddington, J.C., 1534.

25.60 ^{3}He- and ^{4}He-induced reactions and scattering

Spin–orbit effects in optical model analyses of ^{3}He elastic scattering on oxygen isotopes. Abdel-Wahab, M.S., Potvin, L., Roy, R., Bricault, P., Larue, R., Pouliot, D., Rioux, C., and Slobodrian, R.J., 1595.

25.70 Heavy-particle-induced reactions and scattering

Estimation of the nuclear temperature for the Cm(C,xn)No reaction. Pai, H.L., and Andrews, D.G., 1285.

27.40 $39 \leqslant A \leqslant 58$

Measurement of the total cross section of titanium with neutrons of 6–8 m/s. Gabriel, P., and Robson, J.M., 632.

27.50 $59 \leqslant A \leqslant 89$

Gamma decay of $d_{5/2}$ isobaric analogue resonances in the $^{64}Zn(p,\gamma)$ reaction. Rangacharyulu, C., Chatterjee, M.B., Pruneau, C., and St-Pierre, C., 815.

Isospin impurity and core polarization of $g_{9/2}$ IAR fragments in ^{59}Cu. Szöghy, I.M., and Rangarcharyulu, C., 959.

27.60 $90 \leqslant A \leqslant 149$

Levels in ^{145}Nd studied with the (d, t) reaction. Ardal, J., Lien, J.R., Lovhoiden, G., Burke, D.G., and Waddington, J.C., 1534.

27.70 $150 \leqslant A \leqslant 189$

Direct evidence for mixing of two-quasiproton and two-quasineutron configurations in ^{172}Yb. Burke, D.G., and Blezius, J.W., 1751.

29.00 EXPERIMENTAL METHODS AND INSTRUMENTATION FOR ELEMENTARY-PARTICLE AND NUCLEAR PHYSICS

Slow positron beam design notes. Canter, K.F., and Mills, A.P., Jr., 551.

29.30 Radiation spectrometers and spectroscopic techniques

The half-life of ^{176}Lu by a γ–γ coincidence measurement. Sguigna, A.P., Larabee, A.J., and Waddington, J.C., 361.

30.00 ATOMIC AND MOLECULAR PHYSICS

31.10 General theory of structure, transitions and chemical binding

Energies of light atoms in uniform electronic host systems. Stott, M.J., and Zaremba, E., 1145.

Core polarization, relaxation, and relativistic effects in the first ionization potentials for some systems in Cu, Ag, and Au isoelectronic sequences. Migdalek, J., and Baylis, W.E., 1317.

31.15 General mathematical and computational developments

Construction of angular momentum eigenstates in the unitary group formalism for many-electron atomic systems. Schlesinger, M., Kent, R.D., and Drake, G.W.F., 357.

31.20 Specific calculations and results

A calculation of the neon pair polarizability including correlation effects. II. Inclusion of the configuration interaction basis extension corrections. Dacre, P.D., 963.

Higher order molecular spectroscopic constants and dipole moment derivatives for diatomic alkali halides. Shanker, J., and Agrawal, H.B., 1187.

Core polarization, relaxation, and relativistic effects in the first ionization potentials for some systems in Cu, Ag, and Au isoelectronic sequences. Migdalek, J., and Baylis, W.E., 1317.

31.30 Corrections to electronic structure

Two- and three-body effective electrostatic interactions in odd configurations of the iron group. Roth, C., 1223.

Core polarization, relaxation, and relativistic effects in the first ionization potentials for some systems in Cu, Ag, and Au isoelectronic sequences. Migdalek, J., and Baylis, W.E., 1317.

31.90 Other topics in the theory of atoms and molecules

Quadrupole polarizabilities and Sternheimer antishielding factors in the density functional theory. Stott, M.J., Zaremba, E., and Zobin, D., 210.

The hyperfine frequency shift of atomic hydrogen in the presence of helium buffer gas. Jochemsen, R., and Berlinsky, A.J., 252.

32.20 Atomic spectra grouped by wavelength ranges

Laser magnetic resonance of metastable krypton and xenon atoms. Sears, T.J., and McKellar, A.R.W., 345.

Hanle effect of the $5p^1\ P_1^0$ level of calcium and its density dependence. Mathur, M.S., and Kelly, F.M., 1237.

32.60 Zeeman and Stark effect

Laser magnetic resonance of metastable krypton and xenon atoms. Sears, T.J., and McKellar, A.R.W., 345.

32.70 Spectral line shapes and intensities

Déplacements des raies d'émission de l'ion ArII dans un plasma dense. Simard, P.A., 820.

32.80 Photon interactions with atoms

Optical mixing of frequencies of a strong bichromatic field interacting with a three-level atom. II. Numerical results. Mavroyannis, C., Woloschuk, K.J., Hutchinson, D.A., and Downie, C., 245.

Positron–hydrogen ionizing collisions in the presence of a laser field. Cavaliere, P., Leone, C., and Ferrante, G., 605.

Excitation spectra of a three-level atom in the "lambda" configuration at high photon densities. II. Numerical results. Woloschuk, K.J., Hontzeas, S., and Mavroyannis, C., 968.

33.00 MOLECULAR SPECTRA AND INTERACTIONS WITH PHOTONS

An improved method of representing and extrapolating diatomic molecule rotational constants. Tromp, J.W., and LeRoy, R.J., 26.

33.10 Calculation of molecular spectra

Measurements and calculations of self-broadening coefficients of lines belonging to the $2\nu_2$, ν_1, and ν_3 bands of $H_2{}^{16}O$. Mandin, J.-Y., Camy-Peyret, C., Flaud, J.-M., and Guelachvili, G., 94.

33.20 Molecular spectra grouped by wavelength ranges

Collision-induced absorption in ethane in the microwave and far-infrared regions. Dagg, I.R., Smith, W., and Read, L.A.A., 16.

Constantes moléculaires de (100) $\tilde{X}^2B_1$ de NH_2: observation et estimation de la vibration v_3. Vervloet, M., et Merienne-Lafore, M.F., 49.

Laser induced fluorescence of the 0–6, 1–6, and 0–5 bands of the transition $A0_u^+$-$X0_g^+$ of Bi_2. Fabre, G., Bacci, J.P., Athenour, C., Stringat, R., and Bernath, P., 73.

Interaction induced light scattering spectra of amorphous solid and liquid NaOD heavy water solutions. Briganti, G., Fornarini, L., Mazzacurati, V., Ricci, M.A., Signorelli, G., and Nardone, M., 88.

The ν_3 vibration–rotation band of DCP and the equilibrium structure of methinophosphide. Lavigne, J., and Cabana, A., 304.

Second order infrared absorption spectrum of carbon dioxide in the condensed phase. Umapathy, S., and Krishnamurthy, N., 314.

Étude des bandes infrarouges en résonance $2\nu_2$, $\nu_2 + \nu_3$, $2\nu_3^0$, $2\nu_3^{\pm 2}$, $2\nu_3 + \nu_3$ et $4\nu_3$ du chlorure de méthyle. Bensari-Zizi, N., Alamichel, C., et Guelachvili, G., 825.

The 240 nm band system of methylamine: a preliminary analysis of the rotational structure of the 0-0 band of CH_3ND_2. Tsuboi, M., and Hirakawa, A.Y., 844.

Millimetre wave spectrum of silyl acetylene in the ground vibrational state. Carlier, J., and Bauer, A., 1079.

Resonance fluorescence intensities and vibrational assignments in the $\tilde{A}\ ^2B_2$ state of NO_2. Brand, J.C.D., Cross, K.J., and Hoy, A.R., 1081.

Pure vibrational Raman spectra of simple molecular crystals: Ar–N_2, Ar–O_2, Ar–CO, β–CO. Kiefte, H., Clouter, M.J., Rich, N.H., and Ahmad, S.F., 1204.

A new ion-pair state of diatomic iodine. Brand, J.C.D., and Hoy, A.R., 1209.

The magnetic rotation spectrum of thioformaldehyde: singlet–triplet perturbations in the $\tilde{A}\ ^1A_2$ state. Clouthier, D.J., Moule, D.C., Ramsay, D.A., and Birss, F.W., 1212.

The electronic emission spectrum of triatomic hydrogen. IV. Visible bands near 5800 Å and infrared bands near 3950 cm^{-1}. Herzberg, G., Hougen, J.T., and Watson, J.K.G., 1261.

Rotational analysis of the 13 200 and 13 400 cm^{-1} bands of NO_2 by means of Fourier transform spectroscopy. Perrin, A., Flaud, J.-M., Camy-Peyret, C., and Luc, P., 1288.

Intensités des raies d'absorption des bandes perturbées ν_4 et $3\nu_6$ de $^{12}CH_3{}^{35}Cl$. Dang-Nhu, M., Morillon-Chapey, M., Graner, G., et Guelachvili, G., 1328.

Absolute N_2O wavenumbers between 1118 and 1343 cm^{-1} by Fourier transform spectroscopy. Guelachvili, G., 1334.

Low frequency Raman spectra of the liquid and plastic crystal phases of O_2, N_2, CO, and of Ar crystals with these molecules as guests. Rich, N.H., Clouter, M.J., Kiefte, H., and Ahmad, S.F., 1358.

Far infrared absorption spectra in liquid and solid H_2. Buontempo, U., Cunsolo, S., Dore, P., and Nencini, L., 1422.

Collision-induced absorption in the far infrared region in ethylene – rare gas mixtures. Dagg, I.R., Read, L.A.A., and Smith, W., 1431.
Saturation effects in resonant coherent anti-Stokes Raman spectroscopy of inhomogeneously broadened media. Ouellette, F., and Denariez-Roberge, M.-M., 1477.
Study of the $\nu_3 + 2\nu_6^0 +$ and $\nu_2 + 2\nu_3$ infrared bands of methyl chloride. Bensari-Zizi, N., and Alamichel, C., 1661.
A new electronic transition $C^2\pi_r$–$A^2\pi_i$ of A1O. Singh, M., and Saksena, M.D., 1730.

33.25 Nuclear magnetic resonance and relaxation; nuclear quadrupole resonance (NQR)

The cw NMR of $^{13}CH_4$ adsorbed in zeolites 13X and 5A. Higinbotham, J., and Code, R.F., 1770.

33.60 Zeeman and Stark effects

Saturation effects in resonant coherent anti-Stokes Raman spectroscopy of inhomogeneously broadened media. Ouellette, F., and Denariez-Roberge, M.-M., 1477.

33.70 Intensities and shapes of molecular spectral lines and bands

Absorption at 10 μm in CO_2–He and CO_2–N_2 mixtures at elevated temperatures. Robinson, A.M., and Weiss, J.S., 1656.

33.80 Photon interactions with molecules

A new ion-pair state of diatomic iodine. Brand, J.C.D., and Hoy, A.R., 1209.

34.00 ATOMIC AND MOLECULAR COLLISION PROCESSES AND INTERACTIONS

Gaseous positronics – past, present, and future. Massey, H.S.W., 461.
Round-table discussion on future directions in positron-gas research. Fraser, P.A., Bransden, B.H., Coleman, P.G., and Raith, W., 565.
The theoretical KLL Auger spectrum of atomic Na^+ and Ne. Petrini, D., 644.

34.10 General theories and models

Positron–hydrogen scattering with quadratic variational methods. Abdel-Raouf, M.A., 577.
Low-energy positron–hydrogen molecule scattering. Sur, S., and Ghosh, A.S., 597.
Equations de bilan dépendentes du temps appliquées aux collisions inélastiques. Lupaşcu, A., Tudorache St., et Popescu, I.M., 654.
Projected evolution superoperators and the density operator: theory and applications to inelastic scattering. Turner, R.E., Dahler, J.S., and Snider, R.F., 1371.

34.20 Interatomic and intermolecular potentials and forces

The hyperfine frequency shift of atomic hydrogen in the presence of helium buffer gas. Jochemsen, R., and Berlinsky, A.J., 252.

34.40 Elastic scattering of atoms and molecules

Some comments on positron–atom scattering at intermediate energy. Byron, F.W., Jr., 558.

34.50 Inelastic scattering of atoms and molecules

Temperature dependence of cross sections for $7^2P_{1/2} \leftrightarrow 7^2P_{3/2}$ excitation transfer and for quenching in cesium, induced in collisions with H_2, N_2, CH_4, and CD_4. Siara, I.N., Dubois, R.U., and Krause, L., 239.
Beam-foil spectroscopy of Se IV, V, and VI. Bahr, J.L., Pinnington, E.H., Kernahan, J.A., and O'Neill, J.A., 1108.
Projected evolution superoperators and the density operator: theory and applications to inelastic scattering. Turner, R.E., Dahler, J.S., and Snider, R.F., 1371.

34.70 Charge transfer

The interaction of positrons with large atoms and molecules: theory. Schrader, D.M., and Svetic, R.E., 517.
Positronium formation in *s*-wave positron–hydrogen scattering. Humberston, J.W., 591.
Electron loss cross sections from rare gas atoms to Ar^+. Hird, B., and Ali, S.P., 977.
Charge transfer from rare gas atoms to Kr^+. Hird, B., and Ali, S.P., 981.

34.80 Electron scattering

Positron–gas cross-section measurements. Kauppila, W.E., and Stein, T.S., 471.
The interaction of positrons and positronium with small atoms. Drachman, R.J., 494.
Positron–hydrogen scattering with quadratic variational methods. Abdel-Raouf, M.A., 577.
Inelastic scattering of slow positrons by helium, neon, and argon atoms. Coleman, P.G., Hutton, J.T., Cook, D.R., and Chandler, C.A., 584.
Elastic scattering of intermediate-energy positrons and electrons by alkali atoms. Wadehra, J.M., 601.
Positron–hydrogen ionizing collisions in the presence of a laser field. Cavaliere, P., Leone, C., and Ferrante, G., 605.
Broadband photon yield of Kr excited by monoenergetic electron impact above the ionization threshold. Part I: 22–26 eV. Boulay, M., and Marchand, P., 855.
Excitation and polarization analysis of the OD fragment radiation produced by dissociative electron impact on D_2O. Becker, K., and Schulz, G., 1168.
Broadband photon yield of Kr excited by monoenergetic electron impact. Part II: 12–15 eV. Marchand, P., 1775.

34.90 Other topics in atomic and molecular collision processes and interactions

Positron–gas cross-section measurements. Kauppila, W.E., and Stein, T.S., 471.

Positron lifetime spectra for gases. Heyland, G.R., Charlton, M., Griffith, T.C., and Wright, G.L., 503.
Inelastic scattering of slow positrons by helium, neon, and argon atoms. Coleman, P.G., Hutton, J.T., Cook, D.R., and Chandler, C.A., 584.
Elastic scattering of intermediate-energy positrons and electrons by alkali atoms. Wadehra, J.M., 601.

35.10 Atoms

Laser magnetic resonance of metastable krypton and xenon atoms. Sears, T.J., and McKellar, A.R.W., 345.

35.20 Molecules

Rotational analysis of hydroxyl vibration–rotation emission bands: Molecular constants for OH $X^2\Pi$, $6 \leq v \leq 10$. Coxon, J.A., and Foster, S.C., 41.
Constantes moléculaires de (100) $\tilde{X}^2B_1$ de NH_2: observation et estimation de la vibration v_3. Vervloet, M., et Merienne-Lafore, M.F., 49.
New analysis of the (0,0) band of the $^2\Pi \rightarrow {}^2\Sigma$ transition of TiN. Athénour, C., Féménias, J.-L., and Dunn, T.M., 109.

36.00 STUDIES OF SPECIAL ATOMS AND MOLECULES

The interaction of positrons and positronium with small atoms. Drachman, R.J., 494.

36.10 Exotic atoms and molecules (containing mesons, muons, and other abnormal particles)

The interaction of positrons with large atoms and molecules: theory. Schrader, D.M., and Svetic, R.E., 517.
A lower bound to the critical positron mass for binding to a hydrogen atom. Armour, E.A.G., and Schrader, D.M., 581.
Elastic scattering of intermediate-energy positrons and electrons by alkali atoms. Wadehra, J.M., 601.

36.20 Macromolecules and polymer molecules

On gaseous sodium halide dimers. Islam, A.K.M.A., 865.

40.00 CLASSICAL AREAS OF PHENOMENOLOGY

41.10 Classical electromagnetism

Diffraction by an infinite set of hard and soft parallel half planes. Lüneburg, E., and Hurd, R.A., 1.
A variational–Green's function approach to theoretical treatment and applications of the capacitance of three-dimensional geometries. Mandelis, A., 179.
Fluids in electric and magnetic fields: Pressure variation and stability. Brevik, I., 449.
A note on the diffraction of a dipole field by a perfectly conducting wedge. Mohsen, A., 664.
Localisation de l'énergie transportée par une onde électromagnétique à la surface d'un conducteur de section circulaire. Wick, A., Zepp, G., Ritoux, G., et Fabre, G., 868.
Diffraction by an infinite set of soft/hard parallel half-planes: the Riemann approach. Lüneburg, E., 1125.

41.80 Particle beams and particle optics

Propriétés des spectromètres électrostatiques à électrodes en spirale logarithmique. Tremblay, D., et Roy, D., 399.

42.10 Propagation and transmission in homogeneous media

On the diffraction of an arbitrary wave by a wedge. Mohsen, A., 1686.

42.30 Optical information, image formation and analysis

Hologram and image storage in photo-ferroelectrics. el Guibaly, F., 1510.

42.40 Holography

Thickness contours of highly aberrant phase objects. I. Reduced sensitivity holographic interferometry for direct phase measurement. Grover, C.P., and Tremblay, R., 988.
Filtering properties of volume holograms. el Guibaly, F., 1152.
Theoretical diffraction efficiency of nearly unslanted volume multiplexed amplitude holograms. Couture, J.J.A., and Lessard, R.A., 1414.
Hologram and image storage in photo-ferroelectrics. el Guibaly, F., 1510.

42.55 Lasing processes

Experimental study of passive laser pulse compression in a fluorescent dye medium. Faubert, D., and Chin, S.L., 261.
Dynamics of CO_2 laser heated solenoids. McKen, D.C.D., Tighe, W., Fedosejevs, R., and Offenberger, A.A., 1247.
On the light shift in optical pumping of rubidium 87: the techniques of "separated" and "integrated" hyperfine filtering. Vanier, J., Kunski, R., Paulin, P., Têtu, M., and Cyr, N., 1396.
Saturation effects in resonant coherent anti-Stokes Raman spectroscopy of inhomogeneously broadened media. Ouellette, F., and Denariez-Roberge, M.-M., 1477.

42.65 Nonlinear optics

Experimental study of passive laser pulse compression in a fluorescent dye medium. Faubert, D., and Chin, S.L., 261.
The occurrence of the dynamic Stark effect in resonant CARS spectroscopy of a homogeneous medium. Ouellette, F., and Denariez-Roberge, M.M., 877.

Zakharov–Manakov solution of the stimulated Brillouin backscattering generator problem for non-rectangular envelopes. Enns, R.H., 1404.

Zakharov–Manakov solution of the stimulated Brillouin backscattering generator problem for "spliced" potentials. Enns, R.H., 1620.

42.70 Optical materials

Hologram and image storage in photo-ferroelectrics. el Guibaly, F., 1510.

42.80 Optical devices, techniques and applications

Mark IV "Grasshopper" grazing incidence monochromator for the Canadian Synchrotron Radiation Facility (CSRF). Tan, K.H., Bancroft, G.M., Coatsworth, L.L., and Yates, B.W., 131.

Thickness contours of highly aberrant phase objects. II. Double-exposure grating interferometer for direct phase measurement at reduced sensitivity. Grover, C.P., and Tremblay, R., 993.

Filtering properties of volume holograms. el Guibaly, F., 1152.

Multistable nonlinear Fabry–Perot interferometer. Chrostowski, J., Delisle, C., Vallee, R., Carrier, D., and Boulay, L., 1303.

42.82 Integrated optics

Brillouin scattering in thin film optical waveguides. I. Theory of the phonon modes. Rowell, N.L., and Stegeman, G.I., 1788.

Brillouin scattering in thin film optical waveguides. II. Scattering theory. Rowell, N.L., and Stegeman, G.I., 1804.

Brillouin scattering in thin film optical waveguides. III. Experiments. Rowell, N.L., So, V.C-Y., Normandin, R., and Stegeman, G.I., 1821.

47.00 FLUID DYNAMICS

The rise of a cylindrical bubble in an inviscid liquid. Baumel, R.T., Burley, S.K., Freeman, D.F., Gammel, J.L., and Nuttall, J., 999.

47.20 Hydrodynamic stability

A stability theorem for dissipative magnetohydrodynamic equilibria. Teichmann, J., 640.

47.55 Nonhomogeneous flows

The instability of streaming fluids in a porous medium. Sharma, R.C., and Spanos, T.J.T., 1391.

Magnetohydrodynamic free convective flow and mass transfer through a porous medium bounded by an infinite vertical porous plate with constant heat flux. Raptis, A., and Kafousias, N., 1725.

47.65 Magnetohydrodynamics and electrohydrodynamics

A stability theorem for dissipative magnetohydrodynamic equilibria. Teichmann, J., 640.

47.70 Reactive, radiative, or nonequilibrium flows

L'explosion isotherme. Brun, L., et Roguet, R., 168.

50.00 FLUIDS, PLASMAS, AND ELECTRIC DISCHARGES

Transient conditions in inductively heated plasmas: thermodynamic equilibrium and temperature measurements. Meubus, P., 886.

51.10 Kinetic and transport theory

Les moments du flux parallèle non-collisionnel. Fridman, M., 1471.

Annihilation of positrons in noble gases in the presence of an electric field. Arifov, P.U., and Zhuravleva, G.I., 1717.

52.30 Plasma flow; magnetohydrodynamics

A stability theorem for dissipative magnetohydrodynamic equilibria. Teichmann, J., 640.

52.35 Waves, oscillations, and instabilities in plasma

Dressed soliton in a plasma with two warm ion species. Tiwari, R.S., and Sharma, S.R., 154.

Higher order contributions to ion acoustic solitary waves in a plasma consisting of warm ions and nonisothermal electrons. Kalita, M.K., and Bujarbarua, S., 392.

52.55 Plasma equilibrium and confinement

A stability theorem for dissipative magnetohydrodynamic equilibria. Teichmann, J., 640.

52.75 Plasma devices and applications

Mode-locking by an intracavity plasma. Part II. Experimental results. Piché, M., and Bélanger, P.A., 77.

52.80 Electric discharges

Radial variation of excited atom densities in an argon plasma column produced by a microwave surface wave. Moisan, M., Pantel, R., and Ricard, A., 379.

52.90 Other topics in plasma physics and electric discharges

Transient conditions in inductively heated plasmas: thermodynamic equilibrium and temperature measurements. Meubus, P., 886.

60.00 CONDENSED MATTER: STRUCTURE, THERMAL AND MECHANICAL PROPERTIES

61.10 X-ray determination of structures

In situ X-ray diffraction experiments on lithium intercalation compounds. Dahn, J.R., Py, M.A., and Haering, R.R., 307.
Preferred orientation of rapidly frozen metals. Blake, N.W., and Smith, R.W., 1720.

61.14 Electron determination of structures

Structure fine de l'intensité du faisceau électronique réfléchi par le $W(100)$ et l'influence de la chimisorption de l'hydrogène. Baribeau, J.M., et Carette, J.D., 1088.

61.16 Other determination of structures

A study of the host lattice effect in the lanthanide hydroxides. 34 GHz Gd^{3+} impurity ion EPR spectra at 77 and 294 K. Malhotra, V.M., and Buckmaster, H.A., 1573.

61.30 Liquid crystals

Dipole moment and dielectric relaxation studies in some azo compounds. Sarma, P.B.K., Murthy, P.V.G.K., and Murty, C.R.K., 257.

61.60 Specific structure of inorganic compounds

In situ X-ray diffraction experiments on lithium intercalation compounds. Dahn, J.R., Py, M.A., and Haering, R.R., 307.

61.70 Defects in crystals

Positron annihilation studies of quenching and recovery of single crystals of Al and Al – 1.5×10^{-2} at.% Mn. Hood, G.M., and Schultz, R.J., 1117.
Molecular dynamics study of solid argon with N_2, O_2, and CO impurities. Nosé, S., and Klein, M.L., 1365.

62.20 Mechanical properties of solids (related to microscopic structure)

Elastic and photo-elastic constants of CH_4 and CD_4 obtained by Brillouin scattering. Rand, S.C., and Stoicheff, B.P., 287.
Brillouin scattering in thin film optical waveguides. I. Theory of the phonon modes. Rowell, N.L., and Stegeman, G.I., 1788.
Brillouin scattering in thin film optical waveguides. II. Scattering theory. Rowell, N.L., and Stegeman, G.I., 1804.
Brillouin scattering in thin film optical waveguides. III. Experiments. Rowell, N.L., So, V.C-Y., Normandin, R., and Stegeman, G.I., 1821.

63.20 Phonons and vibrations in crystal lattices

Interatomic potential from density functional theory with application to metallic hydrogen. Magaña, F., Whitmore, M.D., and Carbotte, J.P., 424.
Phonon dispersions in calcium tungstate. Kesavasamy, K., and Krishnamurthy, N., 1447.
The crystal dynamics of cuprous halides. Kushwaha, M.S., 1589.

64.10 General theory of equations of state and phase equilibria

Temperature dependence of the pair correlation function in an inhomogeneous liquid: application to $C_{24}Cs$. Plischke, M., and Leckie, W.D., 1139.

64.60 General studies of phase transitions

On the critical behaviour of the two dimensional spin $\frac{1}{2}$ XY model. Rogiers, J., 368.
Models for the phase transition in a monolayer of amphiphilic bipolar molecules on an aqueous substrate. Legré, J.P., Albinet, G., and Caillé, A., 893.

64.70 Phase equilibria, phase transitions, and critical points

Optical measurements of vapor pressures of Rb and a Rb–K mixture. Thompson, D.C., and Xu, G.-X., 1496.

65.90 Other topics in thermal properties of condensed matter

The Salter vapor pressure equation revisited: a new estimate of the anharmonic effects in rare gas solids. Aziz, R.A., and Chen, H.H., 1198.

68.10 Fluid surfaces and interfaces with fluids

Thermal fluctuations in the interface of an inhomogeneous fluid. de Sobrino, L., and Peternelj, J., 137.
A new theory of the liquid condensed–liquid expanded phase transition in lipid monolayers. Georgallas, A., and Pink, D.A., 1678.

68.20 Solid surface structure

Structure fine de l'intensité du faisceau électronique réfléchi par le $W(100)$ et l'influence de la chimisorption de l'hydrogène. Baribeau, J.M., et Carette, J.D., 1088.

68.48 Solid–solid interfaces

Brillouin scattering in thin film optical waveguides. I. Theory of the phonon modes. Rowell, N.L., and Stegeman, G.I., 1788.
Brillouin scattering in thin film optical waveguides. II. Scattering theory. Rowell, N.L., and Stegeman, G.I., 1804.
Brillouin scattering in thin film optical waveguides. III. Experiments. Rowell, N.L., So, V.C-Y., Normandin, R., and Stegeman, G.I., 1821.

68.90 Other topics in the structure and nonelectronic properties of surfaces and thin films

The cw NMR of $^{13}CH_4$ adsorbed in zeolites 13X and 5A. Higinbotham, J., and Code, R.F., 1770.

70.00 CONDENSED MATTER: ELECTRONIC STRUCTURE, ELECTRICAL, MAGNETIC, AND OPTICAL PROPERTIES

71.20 Electronic density of states determinations

Electrical conduction in granular Cu–SiO_2 films. Savvides, N., McAlister, S.P., and Hurd, C.M., 1484.

The effect of a magnetic field on the impurity band density of states in the atomic limit. Liu, K.L., Modrak, P., and Bergersen, B., 1743.

71.25 Nonlocalized single-particle electronic states

Temperature variation of energy gap values in $CuGaSnSe_4$. Lopez-Rivera, S., Goodchild, R.G., Hughes, O.H., Woolley, J.C., and Pamplin, B.R., 10.

A study of the quantum oscillations in the thermopower of molybdenum. Fletcher, R., 122.

The Fermi energy and screening length in n-type GaAs. Sritrakool, W., Glyde, H.R., and Sa-yakanit, V., 373.

The plasma resonance of electron-hole drops in uniaxially stressed germanium. Zarate, H.G., and Timusk, T., 1008.

Energy gap values by optical absorption in I III IV Se_4 compounds. Goodchild, R.G., Hughes, O.H., Lopez-Rivera, S.A., and Woolley, J.C., 1096.

71.30 Metal–insulator transitions

Electrical conduction in granular Cu–SiO_2 films. Savvides, N., McAlister, S.P., and Hurd, C.M., 1484.

71.35 Excitons and related phenomena

Determination of the dilation and vibrational contributions to the temperature shift of excitons in CdS: melting of semiconductors. Manoogian, A., 1490.

Combined effect of exciton–exciton and exciton–phonon interaction on crystal's dielectric properties. Mirjanić, D., Luburić-Kozmidis, U., Marinković, M.M., and Tošić, B.S., 1838.

71.38 Polarons and electron–phonon interactions

Optical absorption in polar crystals with several LO phonon branches. Lépine, Y., and Kartheuser, E., 1180.

Determination of the dilation and vibrational contributions to the temperature shift of excitons in CdS: melting of semiconductors. Manoogian, A., 1490.

71.45 Collective effects

Interatomic potential from density functional theory with application to metallic hydrogen. Magaña, F., Whitmore, M.D., and Carbotte, J.P., 424.

71.55 Impurity and defect levels

Photoluminescence studies of isoelectronic bound excitons associated with the deep acceptors In and Tl in Si. Thewalt, M.L.W., Ziemelis, U.O., Watkins, S.P., and Parsons, R.R., 1691.

71.65 Positron states

Positron annihilation in fatigued copper. Kupca, S., Kerr, D.P., Hogg, B.G., and Basinski, Z.S., 201.

72.00 ELECTRONIC TRANSPORT IN CONDENSED MATTER

The open orbits of potassium. Overhauser, A.W., 687.

Localization and interaction effects in weakly disordered two-dimensional systems. Kaveh, M., 746.

Review of the Fröhlich sliding mode in $NbSe_3$. Ong, N.P., 757.

72.10 Theory of electronic transport; scattering mechanisms

Electron–electron interactions in simple metals and transition metals. MacDonald, A.H., 710.

The electron–phonon interaction in simple metals. Taylor, R., 725.

Ideal transport in transition metals: the rigid-muffin-tin approximation and beyond. Butler, W.H., 735.

Normal metal point contacts. van Kempen, H., 740.

Scattered wave functions and electronic states of dislocations. De Hosson, J.T.M., 779.

72.15 Electronic conduction in metals and alloys

A study of the quantum oscillations in the thermopower of molybdenum. Fletcher, R., 122.

An experimentalist's view of the galvanomagnetic and thermomagnetic properties of potassium. Fletcher, R., 679.

Is potassium a simple metal?. Wiser, N., 693.

High precision electrical resistivity measurements on potassium below 1 K. Pratt, W.P., Jr., 703.

Size effects and low-temperature conductivity anomalies in metallic conductors. Maldague, P.F., 718.

Normal metal point contacts. van Kempen, H., 740.

The interaction of conduction electrons with dislocations and grain boundaries in metals. Brown, R.A., 766.

A comparison of approximations for the elastic electron–electron scattering amplitude in jellium. MacDonald, A.H., and Geldart, D.J.W., 1016.
Measurement of the transport properties of liquid Rb using automated equipment. Cook, J.G., van der Meer, M.P., and Brown, D.J., 1311.
Temperature dependence of the resistivity of $Hg_{3.8}AsF_6$. Batalla, E., and Datars, W.R., 1348.
Transport properties of solid and liquid Cs. Cook, J.G., 1759.

72.20 Conductivity phenomena in semiconductors and insulators

Internal Schottky barriers in semiconductors. Weichman, F.L., 269.
The temperature dependence of the electrical conductivity and switching phenomena in Cu_2O single crystals. Wang, G.J., and Weichman, F.L., 1648.

72.40 Photoconduction and photovoltaic effects; photodielectric effects

Thin-film Cu_2O/Cu photovoltaic cells. Fortin, E., and Sears, W.M., 901.

72.60 Mixed conductivity and conductivity transitions

Electrical conduction in granular Cu–SiO_2 films. Savvides, N., McAlister, S.P., and Hurd, C.M., 1484.

72.80 Conductivity of specific semiconductors and insulators

Compensation by deep levels in semi-insulating GaAs. Lombos, B.A., Yemenidjian, N., and Averous, M., 35.
The effect of static and modulated uniaxial constraint on impurity band conduction in p-type germanium. Lombos, B.A., Averous, M., Fau, C., Calas, J., and Charar, S., 102.
Pure a-ZnTe and a-ZnSe: Reproducibility and deposition control. Moore, C.J.L., and Brodie, D.E., 340.

73.20 Electronic surface states

Structure fine de l'intensité du faisceau électronique réfléchi par le $W(100)$ et l'influence de la chimisorption de l'hydrogène. Baribeau, J.M., et Carette, J.D., 1088.

73.30 Surface double layers, Schottky barriers, and work functions

Thin-film Cu_2O/Cu photovoltaic cells. Fortin, E., and Sears, W.M., 901.

73.40 Interfaces

Normal metal point contacts. van Kempen, H., 740.

73.60 Electronic properties of thin films

Thin-film Cu_2O/Cu photovoltaic cells. Fortin, E., and Sears, W.M., 901.

74.10 Occurrence, critical temperature

Interatomic potential from density functional theory with application to metallic hydrogen. Magaña, F., Whitmore, M.D., and Carbotte, J.P., 424.

74.20 Theory

Weak coupling superconductor with varying electronic density of states. Carbotte, J.P., and Abd El-Rahman, A., 1029.

74.50 Proximity effects, tunnelling phenomena, and Josephson effect

Tunneling into a superconducting proximity sandwich. Smith, H.J.T., and O'Byrne, T., 117.
Dynamics of linear and wrap-around flux shuttles. Blackburn, J.A., 1442.

74.60 Type-II superconductivity

Ginzburg–Landau theory of the Abrikosov vortex state near the upper critical field. Jacobs, A.E., 299.

75.10 General theory and models of magnetic ordering

The critical curve for the quenched dilute random-bond Ising model. Frank, B., Cheung, C.Y., and Barnea, G., 56.
On the critical behaviour of the two dimensional spin $^1/_2XY$ model. Rogiers, J., 368.

75.30 Magnetically ordered materials, other intrinsic properties

De Haas–van Alphen effect in metals containing screw dislocations. Coman, V., and Crişan, M., 1519.

75.40 Critical-point effects, specific heats, short-range order

On the critical behaviour of the two dimensional spin $^1/_2XY$ model. Rogiers, J., 368.

75.50 Studies of specific magnetic materials

The nuclear relaxation rate T_1^{-1} for the itinerant-electron antiferromagnet. Crişan, M., and Gulácsi, Z., 649.
Magnetic and chemical ordering in the Heusler system $Co_2Mn_{1-x}Ti_xSn$. Dunlap, R.A., and Stroink, G., 909.

76.20 General theory of resonances and relaxation

Jahn–Teller interaction in ferricenium cation. Rai, R., 329.

76.30 Electron paramagnetic resonance and relaxation

The effect of core electrons on the spin transfer parameters. Ziaei, M.E., 636.

76.60 Nuclear magnetic resonance and relaxation

Quadrupole polarizabilities and Sternheimer antishielding factors in the density functional theory. Stott, M.J., Zaremba, E., and Zobin, D., 210.

Evidence for precursor clusters associated with structural phase transitions in antifluorite crystals. Armstrong, R.L., D'Iorio, M., and Ramia, M.E., 397.

The cw NMR of $^{13}CH_4$ adsorbed in zeolites 13X and 5A. Higinbotham, J., and Code, R.F., 1770.

NMR study of magnetic doped semiconducting $(SnTe)_{100-x}$ $(MnTe)_x$ compounds. Perrin, B., and Hedgcock, F.T., 1783.

76.80 Mossbauer effect; other gamma-ray spectroscopy

Magnetic and chemical ordering in the Heusler system Co_2Mn_{1-x} Ti_xSn. Dunlap, R.A., and Stroink, G., 909.

A Mössbauer study of a single crystal of the β phase of iron–germanium. Daniels, J.M., Lam, H.Y., and Li, P.L., 1564.

76.90 Other topics in magnetic resonances and relaxation

The cw NMR of $^{13}CH_4$ adsorbed in zeolites 13X and 5A. Higinbotham, J., and Code, R.F., 1770.

77.80 Ferroelectricity and antiferroelectricity

The Curie temperature of a Heisenberg–Ising ferromagnet with uniaxial anisotropy. Tiwari, M., and Srivastava, R.N., 273.

77.90 Other topics in dielectric properties and materials

Combined effect of exciton–exciton and exciton–phonon interaction on crystal's dielectric properties. Mirjanić, D., Luburić-Kozmidis, U., Marinković, M.M., and Tošić, B.S., 1838.

78.20 Optical properties and materials

Elastic and photo-elastic constants of CH_4 and CD_4 obtained by Brillouin scattering. Rand, S.C., and Stoicheff, B.P., 287.

Thermoreflectance measurements on SnS_2 and $SnSe_2$. Brebner, J.L., and Perluzzo, G., 915.

Hologram and image storage in photo-ferroelectrics. el Guibaly, F., 1510.

78.30 Infrared and Raman spectra and scattering

Low frequency Raman spectra of the liquid and plastic crystal phases of O_2, N_2, CO, and of Ar crystals with these molecules as guests. Rich, N.H., Clouter, M.J., Kiefte, H., and Ahmad, S.F., 1358.

78.35 Brillouin and Rayleigh scattering

Elastic and photo-elastic constants of CH_4 and CD_4 obtained by Brillouin scattering. Rand, S.C., and Stoicheff, B.P., 287.

Low frequency Raman spectra of the liquid and plastic crystal phases of O_2, N_2, CO, and of Ar crystals with these molecules as guests. Rich, N.H., Clouter, M.J., Kiefte, H., and Ahmad, S.F., 1358.

Etude par Fabry–Perot des spectres dépolarisés et polarisés du pentachlorobiphenyl liquide entre -54 et $+150$°C. Bezot, P., et Hesse-Bezot, C., 1709.

Brillouin scattering in thin film optical waveguides. I. Theory of the phonon modes. Rowell, N.L., and Stegeman, G.I., 1788.

Brillouin scattering in thin film optical waveguides. II. Scattering theory. Rowell, N.L., and Stegeman, G.I., 1804.

Brillouin scattering in thin film optical waveguides. III. Experiments. Rowell, N.L., So, V.C-Y., Normandin, R., and Stegeman, G.I., 1821.

78.50 Impurity and defect absorption in solids

The absorption spectrum of $KBr:Sn^{2+}$. Scacco, A., and Jacobs, P.W.M., 619.

Optical absorption in polar crystals with several LO phonon branches. Lépine, Y., and Kartheuser, E., 1180.

78.55 Photoluminescence

Temperature dependent Zeeman study of bound exciton and bound multiexciton complex photoluminescence in Si (P) and Si(Li). Ziemelis, U.O., Parsons, R.R., and Thewalt, M.L.W., 222.

Sharp-line, donor–acceptor pair recombination luminescence in Si(In,Li), Si(Ga,Li), Si(Al,Li), and Si(B,Li). Ziemelis, U.O., Thewalt, M.L.W., and Parsons, R.R., 1041.

Photoluminescence studies of isoelectronic bound excitons associated with the deep acceptors In and Tl in Si. Thewalt, M.L.W., Ziemelis, U.O., Watkins, S.P., and Parsons, R.R., 1691.

78.65 Optical properties of thin films

Optical properties of plasma-polymerized organosilicone films. Wertheimer, M.R., Klemberg-Sapieha, J.E., and Corriveau, R., 628.

78.70 Other interactions of matter with particles and radiation

Positronium formation in gaseous ethane and ethane–Ne mixtures. Sharma, S.C., McNutt, J.D., Eftekhari, A., and Ataiiyan, Y.J., 610.

Positron diffusion in krypton and xenon. Câmpeanu, R.I., 615.

80.00 CROSS-DISCIPLINARY PHYSICS AND RELATED AREAS OF SCIENCE AND TECHNOLOGY

81.30 Phase diagrams and microstructures developed by solidification and solid–solid phase transformations

Preferred orientation of rapidly frozen metals. Blake, N.W., and Smith, R.W., 1720.

81.40 Treatment of materials and its effects on microstructures and properties

Magnetic field dependence of plate wave velocity and attenuation in metallic-glass ribbon. Poirier, M., Cheeke, J.D.N., and Germain, L., 385.
Optical properties of plasma-polymerized organosilicone films. Wertheimer, M.R., Klemberg-Sapieha, J.E., and Corriveau, R., 628.

82.65 Surface processes

Phonon echo technique applied to adsorption isotherm measurement. Poirier, M., and Cheeke, J.D.N., 1053.

86.30 Energy conversion

The preparation and some properties of transparent conducting ZnO for use in solar cells. Morgan, J.H., and Brodie, D.E., 1387.

90.00 GEOPHYSICS, ASTRONOMY AND ASTROPHYSICS

92.60 Meteorology

Determination of atmospheric aerosol particle size distribution and visibility using a mobile laboratory. Mathai, C.V., and Harrison, A.W., 1101.

93.85 Instrumentation and techniques for geophysical research

An automatic all sky scanning radiometer. Coombes, C.A., and Harrison, A.W., 919.
Horizon line scanning telephotometry. Harrison, A.W., and Lant, J., 1641.

94.10 Physics of the neutral atmosphere

Mid-latitude summertime measurements of stratospheric NO_2. Kerr, J.B., McElroy, C.T., and Evans, W.F.J., 196.
The instantaneous relationship between polar cap and oval auroras at times of northward interplanetary magnetic field. Murphree, J.S., Anger, C.D., and Cogger, L.L., 349.

94.20 Physics of the ionosphere

A study of postnoon bite-out in foF2 at Karachi. Majeed, T., 1176.

98.80 Cosmology

The early universe in a generalized theory of gravitation. Moffat, J.W., and Vincent, D., 659.

98.90 Other topics in galactic and extragalactic astronomy

The interaction of positrons and positronium with small atoms. Drachman, R.J., 494.

CANADIAN JOURNAL OF PHYSICS

JOURNAL CANADIEN DE PHYSIQUE

VOLUME 60, 1982

Author Index / Index des auteurs

Abd El-Rahman, A., see Carbotte, J.P., 1029.
Abdel-Raouf, M.A. Positron–hydrogen scattering with quadratic variational methods, 577.
Abdel-Wahab, M.S., Potvin, L., Roy, R., Bricault, P., Larue, R., Pouliot, D., Rioux, C., and Slobodrian, R.J. Spin–orbit effects in optical model analyses of ^{3}He elastic scattering on oxygen isotopes, 1595.
Agrawal, H.B., see Shanker, J., 1187.
Ahmad, A., see Khan, A.R., 668.
Ahmad, A., see Khushnood, H., 1523.
Ahmad, S., see Khan, A.R., 668.
Ahmad, S., see Khushnood, H., 1523.
Ahmad, S.F., see Kiefte, H., 1204.
Ahmad, S.F., see Rich, N.H., 1358.
Ahmed, N., Butt, N.M., Beg, M.M., Aslam, J., Khan, Q.H., and Collins, M.F. Order–disorder phase transition in FeAl alloys by neutron diffraction, 1323.
Alamichel, C., see Bensari-Zizi, N., 825.
Alamichel, C., see Bensari-Zizi, N., 1661.
Albinet, G., see Legré, J.P., 893.
Ali, S.P., see Hird, B., 977.
Ali, S.P., see Hird, B., 981.
Ali, U., see Khan, A.R., 668.
Ali, U., see Khushnood, H., 1523.
Amiot, P., see Fontaine, M., 279.
Andrews, D.G., see Pai, H.L., 1285.
Anger, C.D., see Murphree, J.S., 349.
Årdal, J., Lien, J.R., Løvhøidan, G., Burke, D.G., and Waddington, J.C. Levels in ^{145}Nd studied with the (d, t) reaction, 1534.
Arifov, P.U., and Zhuravleva, G.I. Annihilation of positrons in noble gases in the presence of an electric field, 1717.
Armour, E.A.G., and Schrader, D.M. A lower bound to the critical positron mass for binding to a hydrogen atom, 581.
Armstrong, R.L., D'Iorio, M., and Ramia, M.E. Evidence for precursor clusters associated with structural phase transitions in antifluorite crystals, 397.
Aslam, J., see Ahmed, N., 1323.
Ataiiyan, Y.J., see Sharma, S.C., 610.
Athenour, C., see Fabre, G., 73.
Athénour, C., Féménias, J.-L., and Dunn, T.M. New analysis of the (0,0) band of the $^2\Pi \rightarrow {}^2\Sigma$ transition of TiN, 109.
Averous, M., see Lombos, B.A., 35.
Averous, M., see Lombos, B.A., 102.
Aziz, A.R.K., see Habeeb, M.A.Z., 809.
Aziz, R.A., and Chen, H.H. The Salter vapor pressure equation revisited: a new estimate of the anharmonic effects in rare gas solids, 1198.
Bacci, J.P., see Fabre, G., 73.
Bahr, J.L., Pinnington, E.H., Kernahan, J.A., and O'Neill, J.A. Beam-foil spectroscopy of Se IV, V, and VI, 1108.
Bancroft, G.M., see Tan, K.H., 131.
Baribeau, J.M., et Carette, J.D. Structure fine de l'intensité du faisceau électronique réfléchi par le $W(100)$ et l'influence de la chimisorption de l'hydrogène, 1088.
Barnea, G., see Frank, B., 56.
Basinski, Z.S., see Kupca, S., 201.
Basu, M., see Ghosh, D., 805.
Batalla, E., and Datars, W.R. Temperature dependence of the resistivity of $Hg_{3-\delta}AsF_6$, 1348.
Bauer, A., see Carlier, J., 1079.
Baumel, R.T., Burley, S.K., Freeman, D.F., Gammel, J.L., and Nuttall, J. The rise of a cylindrical bubble in an inviscid liquid, 999.

Baylis, W.E., see Migdalek, J., 1317.
Becker, K., and Schulz, G. Excitation and polarization analysis of the OD fragment radiation produced by dissociative electron impact on D_2O, 1168.
Beg, M.M., see Ahmed, N., 1323.
Bélanger, P.A., see Piché, M., 77.
Bensari-Zizi, N., and Alamichel, C. Study of the $\nu_3 + 2\nu_6^0$ and $\nu_2 + 2\nu_3$ infrared bands of methyl chloride, 1661.
Bensari-Zizi, N., Alamichel, C., et Guelachvili, G. Étude des bandes infrarouges en résonance $2\nu_2$, $\nu_2 + \nu_5$, $2\nu_5^0$, $2\nu_5^{\pm 2}$, $2\nu_3 + \nu_5$ et $4\nu_3$ du chlorure de méthyle, 825.
Bergersen, B., see Liu, K.L., 1743.
Berlinsky, A.J., see Jochemsen, R., 252.
Bernath, P., see Fabre, G., 73.
Bezot, P., et Hesse-Bezot, C. Etude par Fabry–Perot des spectres dépolarisés et polarisés du pentachlorobiphenyl liquide entre −54 et +150°C, 1709.
Bidasaria, H.B., see Townsend, L.W., 1514.
Birss, F.W., see Clouthier, D.J., 1212.
Bishara, B.A. Irrotational core in deformed nuclei, 337.
Blackburn, J.A. Dynamics of linear and wrap-around flux shuttles, 1442.
Blake, N.W., and Smith, R.W. Preferred orientation of rapidly frozen metals, 1720.
Blezius, J.W., see Burke, D.G., 1751.
Boulay, L., see Chrostowski, J., 1303.
Boulay, M., and Marchand, P. Broadband photon yield of Kr excited by monoenergetic electron impact above the ionization threshold. Part I: 22–26 eV, 855.
Brand, J.C.D., Cross, K.J., and Hoy, A.R. Resonance fluorescence intensities and vibrational assignments in the $A\ ^2B_2$ state of NO_2, 1081.
Brand, J.C.D., and Hoy, A.R. A new ion-pair state of diatomic iodine, 1209.
Bransden, B.H., see Fraser, P.A., 565.
Brebner, J.L., and Perluzzo, G. Thermoreflectance measurements on SnS_2 and $SnSe_2$, 915.
Brevik, I. Fluids in electric and magnetic fields: Pressure variation and stability, 449.
Bricault, P., see Abdel-Wahab, M.S., 1595.
Brickett, P.A., see Vrba, J., 1060.
Briganti, G., Fornarini, L., Mazzacurati, V., Ricci, M.A., Signorelli, G., and Nardone, M. Interaction induced light scattering spectra of amorphous solid and liquid NaOD heavy water solutions, 88.
Brodie, D.E., see Moore, C.J.L., 340.
Brodie, D.E., see Morgan, J.H., 1387.
Brown, D.J., see Cook, J.G., 1311.
Brown, R.A. The interaction of conduction electrons with dislocations and grain boundaries in metals, 766.
Brumbaugh, B.E., and Price, R.H. Event horizon area in a slowly changing Weyl geometry, 1155.
Brun, L., et Roguet, R. L'explosion isotherme, 168.
Buckmaster, H.A., see Malhotra, V.M., 1573.
Bujarbarua, S., see Kalita, M.K., 392.
Buontempo, U., Cunsolo, S., Dore, P., and Nencini, L. Far infrared absorption spectra in liquid and solid H_2, 1422.
Burbank, M.B., see Vrba, J., 1060.
Burke, D.G., see Ardal, J., 1534.
Burke, D.G., and Blezius, J.W. Direct evidence for mixing of two-quasiproton and two-quasineutron configurations in ^{172}Yb, 1751.
Burley, S.K., see Baumel, R.T., 999.
Butler, W.H. Ideal transport in transition metals: the rigid-muffin-tin approximation and beyond, 735.
Butt, N.M., see Ahmed, N., 1323.
Byron, F.W., Jr. Some comments on positron–atom scattering at intermediate energy, 558.
Cabana, A., see Lavigne, J., 304.
Caillé, A., see Legré, J.P., 893.
Calas, J., see Lombos, B.A., 102.
Campbell, B.A. Single particle inclusive leptoproduction in quantum chromodynamics, 939.
Câmpeanu, R.I. Positron diffusion in krypton and xenon, 615.
Camy-Peyret, C., see Mandin, J.-Y., 94.
Camy-Peyret, C., see Perrin, A., 1288.
Canter, K.F., and Mills, A.P., Jr. Slow positron beam design notes, 551.
Caplan, H.S., see Sealock, R.M., 1257.
Carbotte, J.P., and Abd El-Rahman, A. Weak coupling superconductor with varying electronic density of states, 1029.
Carbotte, J.P., see Magaña, F., 424.
Carette, J.D., see Baribeau, J.M., 1088.
Carlier, J., and Bauer, A. Millimetre wave spectrum of silyl acetylene in the ground vibrational state, 1079.

Carrier, D., see Chrostowski, J., 1303.
Cavaliere, P., Leone, C., and Ferrante, G. Positron–hydrogen ionizing collisions in the presence of a laser field, 605.
Chandler, C.A., see Coleman, P.G., 584.
Charar, S., see Lombos, B.A., 102.
Charlton, M., see Heyland, G.R., 503.
Chatterjee, M.B., see Rangacharyulu, C., 815.
Chatterjee, R., see Lulek, B., 927.
Chaubey, A.K., see Varshney, V.P., 1461.
Cheeke, J.D.N., see Poirier, M., 385.
Cheeke, J.D.N., see Poirier, M., 1053.
Chen, H.H., see Aziz, R.A., 1198.
Cheung, C.Y., see Frank, B., 56.
Chin, S.L., see Faubert, D., 261.
Chrostowski, J., Delisle, C., Vallee, R., Carrier, D., and Boulay, L. Multistable nonlinear Fabry–Perot interferometer, 1303.
Clarke, J.N., Karl, G., and Watson, P.J.S. The optical activity of intergalactic space, 1561.
Clouter, M.J., see Kiefte, H., 1204.
Clouter, M.J., see Rich, N.H., 1358.
Clouthier, D.J., Moule, D.C., Ramsay, D.A., and Birss, F.W. The magnetic rotation spectrum of thioformaldehyde: singlet–triplet perturbations in the $\tilde{A}\,^1A_2$ state, 1212.
Coatsworth, L.L., see Tan, K.H., 131.
Code, R.F., see Higinbotham, J., 1770.
Cogger, L.L., see Murphree, J.S., 349.
Coleman, P.G., see Fraser, P.A., 565.
Coleman, P.G., Hutton, J.T., Cook, D.R., and Chandler, C.A. Inelastic scattering of slow positrons by helium, neon, and argon atoms, 584.
Collins, M.F., see Ahmed, N., 1323.
Coman, V., and Crişan, M. De Haas–van Alphen effect in metals containing screw dislocations, 1519.
Cook, D.R., see Coleman, P.G., 584.
Cook, J.G. Transport properties of solid and liquid Cs, 1759.
Cook, J.G., van der Meer, M.P., and Brown, D.J. Measurement of the transport properties of liquid Rb using automated equipment, 1311.
Coombes, C.A., and Harrison, A.W. An automatic all sky scanning radiometer, 919.
Corriveau, R., see Wertheimer, M.R., 628.
Couture, J.J.A., and Lessard, R.A. Theoretical diffraction efficiency of nearly unslanted volume multiplexed amplitude holograms, 1414.
Coxon, J.A., and Foster, S.C. Rotational analysis of hydroxyl vibration–rotation emission bands: Molecular constants for OH $X^2\Pi$, $6 \leq v \leq 10$, 41.
Crişan, M., see Coman, V., 1519.
Crişan, M., and Gulácsi, Z. The nuclear relaxation rate T_1^{-1} for the itinerant-electron antiferromagnet, 649.
Cross, K.J., see Brand, J.C.D., 1081.
Cunsolo, S., see Buontempo, U., 1422.
Cyr, N., see Vanier, J., 1396.
Dacre, P.D. A calculation of the neon pair polarizability including correlation effects. II. Inclusion of the configuration interaction basis extension corrections, 963.
Dagg, I.R., Read, L.A.A., and Smith, W. Collision-induced absorption in the far infrared region in ethylene – rare gas mixtures, 1431.
Dagg, I.R., Smith, W., and Read, L.A.A. Collision-induced absorption in ethane in the microwave and far-infrared regions, 16.
Dahler, J.S., see Turner, R.E., 1371.
Dahn, J.R., Py, M.A., and Haering, R.R. *In situ* X-ray diffraction experiments on lithium intercalation compounds, 307.
Dang-Nhu, M., Morillon-Chapey, M., Graner, G., et Guelachvili, G. Intensités des raies d'absorption des bandes perturbées ν_4 et $3\nu_6$ de $^{12}CH_3{}^{35}Cl$, 1328.
Daniels, J.M., Lam, H.Y., and Li, P.L. A Mössbauer study of a single crystal of the β phase of iron–germanium, 1564.
Darewych, J.W. A note on bounds to central potential scattering parameters, 1075.
Datars, W.R., see Batalla, E., 1348.
De Hosson, J.T.M. Scattered wave functions and electronic states of dislocations, 779.
Delisle, C., see Chrostowski, J., 1303.
Denariez-Roberge, M.M., see Ouellette, F., 877.
Denariez-Roberge, M.-M., see Ouellette, F., 1477.
de Sobrino, L., and Peternelj, J. Thermal fluctuations in the interface of an inhomogeneous fluid, 137.
D'Iorio, M., see Armstrong, R.L., 397.
Dore, P., see Buontempo, U., 1422.

Downie, C., see Mavroyannis, C., 245.
Drachman, R.J. The interaction of positrons and positronium with small atoms, 494.
Drake, G.W.F., see Schlesinger, M., 357.
Dubois, R.U., see Siara, I.N., 239.
Dunlap, R.A., and Stroink, G. Magnetic and chemical ordering in the Heusler system $Co_2Mn_{1-x}Ti_xSn$, 909.
Dunn, T.M., see Athénour, C., 109.
Duplain, D., and Goulard, B. The effects of ground state correlations in ^{16}O on the muonuclear sum rule, 321.
Eftekhari, A., see Sharma, S.C., 610.
el Guibaly, F. Filtering properties of volume holograms, 1152.
el Guibaly, F. Hologram and image storage in photo-ferroelectrics, 1510.
Enns, R.H. Zakharov–Manakov solution of the stimulated Brillouin backscattering generator problem for non-rectangular envelopes, 1404.
Enns, R.H. Zakharov–Manakov solution of the stimulated Brillouin backscattering generator problem for "spliced" potentials, 1620.
Evans, W.F.J., see Kerr, J.B., 196.
Fabre, G., Bacci, J.P., Athenour, C., Stringat, R., and Bernath, P. Laser induced fluorescence of the 0–6, 1–6, and 0–5 bands of the transition $A0_u^+$-$X0_g^+$ of Bi_2, 73.
Fabre, G., see Wick, A., 868.
Fau, C., see Lombos, B.A., 102.
Faubert, D., and Chin, S.L. Experimental study of passive laser pulse compression in a fluorescent dye medium, 261.
Fedosejevs, R., see McKen, D.C.D., 1247.
Féménias, J.-L., see Athénour, C., 109.
Ferrante, G., see Cavaliere, P., 605.
Fife, A.A., see Vrba, J., 1060.
Flaud, J.-M., see Mandin, J.-Y., 94.
Flaud, J.-M., see Perrin, A., 1288.
Fleming, D.G. A 20 MeV (p,d) study of nuclear structure in the even and odd tin isotopes, 428.
Fletcher, R. A study of the quantum oscillations in the thermopower of molybdenum, 122.
Fletcher, R. An experimentalist's view of the galvanomagnetic and thermomagnetic properties of potassium, 679.
Fontaine, M., and Amiot, P. Prescission dissipation in nuclear fission from a microscopic point of view, 279.
Fornarini, L., see Briganti, G., 88.
Fortin, E., and Sears, W.M. Thin-film Cu_2O/Cu photovoltaic cells, 901.
Foster, S.C., see Coxon, J.A., 41.
Frank, B., Cheung, C.Y., and Barnea, G. The critical curve for the quenched dilute random-bond Ising model, 56.
Fraser, P.A., Bransden, B.H., Coleman, P.G., and Raith, W. Round-table discussion on future directions in positron-gas research, 565.
Freeman, D.F., see Baumel, R.T., 999.
Fridman, M. Les moments du flux parallèle non-collisionnel, 1471.
Fujishiro, M., Tabata, T., Okamoto, K., and Tsujimoto, T. Cross section of the reaction $^9Be(\gamma, n)$ near threshold, 1672.
Gabriel, P., and Robson, J.M. Measurement of the total cross section of titanium with neutrons of 6–8 m/s, 632.
Gagnon, R. The quark–gluon phase in strong interacting matter, 797.
Gammel, J.L., see Baumel, R.T., 999.
Gautrin, H.-F. Bäcklund transformation according to Gerdzikov and Kullish for the Korteweg–de Vries equation, 1599.
Geldart, D.J.W., see MacDonald, A.H., 1016.
Georgalas, C.G., and Papargyropoulos, P.H. Inclusive cross sections, in the central region, in terms of a Pomeron which saturates the Froissart bound, 950.
Georgallas, A., and Pink, D.A. A new theory of the liquid condensed–liquid expanded phase transition in lipid monolayers, 1678.
Germain, L., see Poirier, M., 385.
Ghosh, A.S., see Sur, S., 597.
Ghosh, D., Roy, J., Naha, S., Basu, M., and Sengupta, K. Study of multiparticle rapidity clustering in hadronic interaction at 70 GeV/c, 805.
Gidley, D.W. Positronium and quantum electrodynamics, 543.
Glyde, H.R., see Sritrakool, W., 373.
Goodchild, R.G., Hughes, O.H., Lopez-Rivera, S.A., and Woolley, J.C. Energy gap values by optical absorption in I III IV Se_4 compounds, 1096.
Goodchild, R.G., see Lopez-Rivera, S., 10.
Goulard, B., see Duplain, D., 321.
Goulard, G., and Lorazo, B. Deuteron photoabsorption sum rule: Two-body effects, 162.
Graner, G., see Dang-Nhu, M., 1328.
Griffith, T.C., see Heyland, G.R., 503.
Grover, C.P., and Tremblay, R. Thickness contours of highly aberrant phase objects. I. Reduced sensitivity holographic interferometry for direct phase measurement, 988.

Grover, C.P., and Tremblay, R. Thickness contours of highly aberrant phase objects. II. Double-exposure grating interferometer for direct phase measurement at reduced sensitivity, 993.
Guelachvili, G. Absolute N_2O wavenumbers between 1118 and 1343 cm^{-1} by Fourier transform spectroscopy, 1334.
Guelachvili, G., see Bensari-Zizi, N., 825.
Guelachvili, G., see Dang-Nhu, M., 1328.
Guelachvili, G., see Mandin, J.-Y., 94.
Gujrathi, S., see Jeremie, H., 1616.
Gulácsi, Z., see Crişan, M., 649.
Gupta, D.K., see Varshney, V.P., 1461.
Gupta, K.K., see Varshney, V.P., 1461.
Habeeb, M.A.Z., and Aziz, A.R.K. Single-particle currents in the cranked harmonic oscillator model, 809.
Haering, R.R., see Dahn, J.R., 307.
Haq, R.U., and Wong, S.S.M. Nuclear level densities, 1502.
Harrison, A.W., see Coombes, C.A., 919.
Harrison, A.W., and Lant, J. Horizon line scanning telephotometry, 1641.
Harrison, A.W., see Mathai, C.V., 1101.
Hedgcock, F.T., see Perrin, B., 1783.
Herzberg, G., Hougen, J.T., and Watson, J.K.G. The electronic emission spectrum of triatomic hydrogen. IV. Visible bands near 5800 Å and infrared bands and infrared bands near 3950 cm^{-1}, 1261.
Hesse-Bezot, C., see Bezot, P., 1709.
Heyland, G.R., Charlton, M., Griffith, T.C., and Wright, G.L. Positron lifetime spectra for gases, 503.
Higinbotham, J., and Code, R.F. The cw NMR of $^{13}CH_4$ adsorbed in zeolites 13X and 5A, 1770.
Hirakawa, A.Y., see Tsuboi, M., 844.
Hird, B., and Ali, S.P. Electron loss cross sections from rare gas atoms to Ar^+, 977.
Hird, B., and Ali, S.P. Charge transfer from rare gas atoms to Kr^+, 981.
Hogg, B.G., see Kupca, S., 201.
Hontzeas, S., see Woloschuk, K.J., 968.
Hood, G.M., and Schultz, R.J. Positron annihilation studies of quenching and recovery of single crystals of Al and Al – 1.5 $\times$ 10^{-2} at.% Mn, 1117.
Hougen, J.T., see Herzberg, G., 1261.
Hoy, A.R., see Brand, J.C.D., 1081.
Hoy, A.R., see Brand, J.C.D., 1209.
Hughes, O.H., see Goodchild, R.G., 1096.
Hughes, O.H., see Lopez-Rivera, S., 10.
Humberston, J.W. Positronium formation in *s*-wave positron–hydrogen scattering, 591.
Hurd, C.M., see Savvides, N., 1484.
Hurd, R.A., see Lüneburg, E., 1.
Hutchinson, D.A., see Mavroyannis, C., 245.
Hutton, J.T., see Coleman, P.G., 584.
Irfan, M., see Khan, A.R., 668.
Irfan, M., see Khushnood, H., 1523.
Islam, A.K.M.A. On gaseous sodium halide dimers, 865.
Jacobs, A.E. Ginzburg–Landau theory of the Abrikosov vortex state near the upper critical field, 299.
Jacobs, P.W.M., see Scacco, A., 619.
Jeremie, H., Lessard, L., Gujrathi, S., and Zeitnitz, B. The N–P final state interaction in the $^2H(d,np)^2H$ reaction at 12 MeV, 1616.
Jochemsen, R., and Berlinsky, A.J. The hyperfine frequency shift of atomic hydrogen in the presence of helium buffer gas, 252.
Kafousias, N., see Raptis, A., 1725.
Kalita, M.K., and Bujarbarua, S. Higher order contributions to ion acoustic solitary waves in a plasma consisting of warm ions and nonisothermal electrons, 392.
Karl, G., see Clarke, J.N., 1561.
Kartheuser, E., see Lépine, Y., 1180.
Kauppila, W.E., and Stein, T.S. Positron–gas cross-section measurements, 471.
Kaur, M., and Kohli, J.M. Comparative study of momentum and rapidity spectra of pions produced in hadron–nucleon and hadron–nucleus collisions, 802.
Kaveh, M. Localization and interaction effects in weakly disordered two-dimensional systems, 746.
Kavogli, Z.I., see Koumelis, C.N., 1241.
Kelly, F.M., see Mathur, M.S., 1237.
Kent, R.D., see Schlesinger, M., 357.
Kernahan, J.A., see Bahr, J.L., 1108.
Kerr, D.P., see Kupca, S., 201.
Kerr, J.B., McElroy, C.T., and Evans, W.F.J. Mid-latitude summertime measurements of stratospheric NO_2, 196.

Kesavasamy, K., and Krishnamurthy, N. Phonon dispersions in calcium tungstate, 1447.
Khan, A.R., Ali, U., Ahmad, A., Ahmad, S., Irfan, M., Zafar, M., and Shafi, M. Some characteristics of the medium energy particles produced in $\bar{\pi}$-nucleus collisions, 668.
Khan, A.R., see Khushnood, H., 1523.
Khan, Q.H., see Ahmed, N., 1323.
Khushnood, H., Irfan, M., Zafar, M., Ahmad, A., Khan, A.R., Ahmad, S., Ali, U., and Shafi, M. A study of particle–nucleus collisions at 24, 50, and 400 GeV/c, 1523.
Kiefte, H., Clouter, M.J., Rich, N.H., and Ahmad, S.F. Pure vibrational Raman spectra of simple molecular crystals: Ar–N_2, Ar–O_2, Ar–CO, β–CO, 1204.
Kiefte, H., see Rich, N.H., 1358.
Klein, M.L., see Nosé, S., 1365.
Klemberg-Sapieha, J.E., see Wertheimer, M.R., 628.
Kohli, J.M., see Kaur, M., 802.
Kohno, M., and Sprung, D.W.L. On the quenching of the spin flip excitation strength due to the isobar–hole excitation process, 1193.
Koumelis, C.N., Londos, C.A., Kavogli, Z.I., Leventouri, D.K., Vassilikou, A.B., and Zardas, G.E. On a mosaic graphite spectrometer without collimators, 1241.
Krause, L., see Siara, I.N., 239.
Krishnamurthy, N., see Kesavasamy, K., 1447.
Krishnamurthy, N., see Umapathy, S., 314.
Kunski, R., see Vanier, J., 1396.
Kupca, S., Kerr, D.P., Hogg, B.G., and Basinski, Z.S. Positron annihilation in fatigued copper, 201.
Kushwaha, M.S. The crystal dynamics of cuprous halides, 1589.
Lai, C.S. On the logarithmic perturbation theory for screened Coulomb potentials, 365.
Lam, H.Y., see Daniels, J.M., 1564.
Lant, J., see Harrison, A.W., 1641.
Larabee, A.J., see Sguigna, A.P., 361.
Larue, R., see Abdel-Wahab, M.S., 1595.
Lavigne, J., and Cabana, A. The ν_3 vibration–rotation band of DCP and the equilibrium structure of methinophosphide, 304.
Leckie, W.D., see Plischke, M., 1139.
Lee, H.C., and Winterbon, K.B. Strangeness-changing nonlepton decays of the kaons, hyperons, and the Ω^- particle, 405.
Legré, J.P., Albinet, G., and Caillé, A. Models for the phase transition in a monolayer of amphiphilic bipolar molecules on an aqueous substrate, 893.
Leone, C., see Cavaliere, P., 605.
Lépine, Y., and Kartheuser, E. Optical absorption in polar crystals with several LO phonon branches, 1180.
LeRoy, R.J., see Tromp, J.W., 26.
Lessard, L., see Jeremie, H., 1616.
Lessard, R.A., see Couture, J.J.A., 1414.
Leventouri, D.K., see Koumelis, C.N., 1241.
Li, P.L., see Daniels, J.M., 1564.
Lien, J.R., see Ardal, J., 1534.
Liu, K.L., Modrak, P., and Bergersen, B. The effect of a magnetic field on the impurity band density of states in the atomic limit, 1743.
Lombos, B.A., Averous, M., Fau, C., Calas, J., and Charar, S. The effect of static and modulated uniaxial constraint on impurity band conduction in p-type germanium, 102.
Lombos, B.A., Yemenidjian, N., and Averous, M. Compensation by deep levels in semi-insulating GaAs, 35.
Londos, C.A., see Koumelis, C.N., 1241.
Lopez-Rivera, S., Goodchild, R.G., Hughes, O.H., Woolley, J.C., and Pamplin, B.R. Temperature variation of energy gap values in $CuGaSnSe_4$, 10.
Lopez-Rivera, S.A., see Goodchild, R.G., 1096.
Lorazo, B., see Goulard, G., 162.
Løvhøidan, G., see Årdal, J., 1534.
Luburić-Kozmidis, U., see Mirjanić, D., 1838.
Luc, P., see Perrin, A., 1288.
Lulek, B., Lulek, T., and Chatterjee, R. Racah algebra for the double trigonal group, 927.
Lulek, T., see Lulek, B., 927.
Lüneburg, E. Diffraction by an infinite set of soft/hard parallel half-planes: the Riemann approach, 1125.
Lüneburg, E., and Hurd, R.A. Diffraction by an infinite set of hard and soft parallel half planes, 1.
Lupaşcu, A., Tudorache, St., et Popescu, I.M. Equations de bilan dépendentes du temps appliquées aux collisions inélastiques, 654.
MacDonald, A.H. Electron–electron interactions in simple metals and transition metals, 710.
MacDonald, A.H., and Geldart, D.J.W. A comparison of approximations for the elastic electron–electron scattering amplitude in jellium, 1016.

Magaña, F., Whitmore, M.D., and Carbotte, J.P. Interatomic potential from density functional theory with application to metallic hydrogen, 424.
Majeed, T. A study of postnoon bite-out in foF2 at Karachi, 1176.
Maldague, P.F. Size effects and low-temperature conductivity anomalies in metallic conductors, 718.
Malhotra, V.M., and Buckmaster, H.A. A study of the host lattice effect in the lanthanide hydroxides. 34 GHz Gd^{3+} impurity ion EPR spectra at 77 and 294 K, 1573.
Mandelis, A. A variational–Green's function approach to theoretical treatment and applications of the capacitance of three-dimensional geometries, 179.
Mandin, J.-Y., Camy-Peyret, C., Flaud, J.-M., and Guelachvili, G. Measurements and calculations of self-broadening coefficients of lines belonging to the $2\nu_2$, ν_1, and ν_3 bands of $H_2{}^{16}O$, 94.
Mann, R.B. Erratum: Comments on tensor analysis in generalized spacetimes, 383.
Mann, R.B., and Moffat, J.W. Erratum: Equivalence principle for charged bodies in a theory of gravitation, 383.
Manoogian, A. Determination of the dilation and vibrational contributions to the temperature shift of excitons in CdS: melting of semiconductors, 1490.
Marchand, P. Broadband photon yield of Kr excited by monoenergetic electron impact. Part II: 12–15 eV, 1775.
Marchand, P., see Boulay, M., 855.
Marinković, M.M., see Mirjanić, D., 1838.
Massey, H.S.W. Gaseous positronics – past, present, and future, 461.
Mathai, C.V., and Harrison, A.W. Determination of atmospheric aerosol particle size distribution and visibility using a mobile laboratory, 1101.
Mathur, M.S., and Kelly, F.M. Hanle effect of the $5p^1\,P_1^0$ level of calcium and its density dependence, 1237.
Mavroyannis, C., Woloschuk, K.J., Hutchinson, D.A., and Downie, C. Optical mixing of frequencies of a strong bichromatic field interacting with a three-level atom. II. Numerical results, 245.
Mavroyannis, C., see Woloschuk, K.J., 968.
Mazzacurati, V., see Briganti, G., 88.
McAlister, S.P., see Savvides, N., 1484.
McDow, J.C., and Moffat, J.W. Equivalence principle for massive bodies in a generalized theory of gravitation. I, 1545.
McDow, J.C., and Moffat, J.W. Equivalence principle for massive bodies in a generalized theory of gravitation. II, 1556.
McElroy, C.T., see Kerr, J.B., 196.
McKellar, A.R.W., see Sears, T.J., 345.
McKen, D.C.D., Tighe, W., Fedosejevs, R., and Offenberger, A.A. Dynamics of CO_2 laser heated solenoids, 1247.
McKeon, G. Dependence on the renormalization points in a simple scalar theory, 789.
McKeon, G. Non-leading mass effects in the effective weak Hamiltonian for $\Delta c = 1$ decays, 1163.
McKeon, G. Dimensional reduction and background field quantization, 1429.
McNutt, J.D., see Sharma, S.C., 610.
Merienne-Lafore, M.F., see Vervloet, M., 49.
Meubus, P. Transient conditions in inductively heated plasmas: thermodynamic equilibrium and temperature measurements, 886.
Migdalek, J., and Baylis, W.E. Core polarization, relaxation, and relativistic effects in the first ionization potentials for some systems in Cu, Ag, and Au isoelectronic sequences, 1317.
Miller, G.A., see Théberge, S., 59.
Mills, A.P., Jr., see Canter, K.F., 551.
Mirjanić, D., Luburić-Kozmidis, U., Marinković, M.M., and Tošić, B.S. Combined effect of exciton–exciton and exciton–phonon interaction on crystal's dielectric properties, 1838.
Modrak, P., see Liu, K.L., 1743.
Moffat, J.W., see Mann, R.B., 383.
Moffat, J.W., see McDow, J.C., 1545.
Moffat, J.W., see McDow, J.C., 1556.
Moffat, J.W., and Vincent, D. The early universe in a generalized theory of gravitation, 659.
Mohsen, A. A note on the diffraction of a dipole field by a perfectly conducting wedge, 664.
Mohsen, A. On the diffraction of an arbitrary wave by a wedge, 1686.
Moisan, M., Pantel, R., and Ricard, A. Radial variation of excited atom densities in an argon plasma column produced by a microwave surface wave, 379.
Moore, C.J.L., and Brodie, D.E. Pure a-ZnTe and a-ZnSe: Reproducibility and deposition control, 340.
Morgan, J.H., and Brodie, D.E. The preparation and some properties of transparent conducting ZnO for use in solar cells, 1387.
Morillon-Chapey, M., see Dang-Nhu, M., 1328.
Moule, D.C., see Clouthier, D.J., 1212.
Murphree, J.S., Anger, C.D., and Cogger, L.L. The instantaneous relationship between polar cap and oval auroras at times of northward interplanetary magnetic field, 349.
Murthy, P.V.G.K., see Sarma, P.B.K., 257.
Murty, C.R.K., see Sarma, P.B.K., 257.
Naha, S., see Ghosh, D., 805.

Nardone, M., see Briganti, G., 88.
Nash, G.F. Octupole resonance states in the nucleus oxygen 16, 1607.
Nencini, L., see Buontempo, U., 1422.
Nogami, Y., and van Dijk, W. Scattering length and effective range for the Coulomb plus separable potential, 205.
Normandin, R., see Rowell, N.L., 1821.
Nosé, S., and Klein, M.L. Molecular dynamics study of solid argon with N_2, O_2, and CO impurities, 1365.
Nuttall, J., see Baumel, R.T., 999.
O'Byrne, T., see Smith, H.J.T., 117.
Offenberger, A.A., see McKen, D.C.D., 1247.
Okamoto, K., see Fujishiro, M., 1672.
O'Neill, J.A., see Bahr, J.L., 1108.
Ong, N.P. Review of the Fröhlich sliding mode in $NbSe_3$, 757.
Ouellette, F., and Denariez-Roberge, M.M. The occurrence of the dynamic Stark effect in resonant CARS spectroscopy of a homogeneous medium, 877.
Ouellette, F., and Denariez-Roberge, M.-M. Saturation effects in resonant coherent anti-Stokes Raman spectroscopy of inhomogeneously broadened media, 1477.
Overhauser, A.W. The open orbits of potassium, 687.
Pai, H.L., and Andrews, D.G. Estimation of the nuclear temperature for the Cm(C,*x*n)No reaction, 1285.
Pamplin, B.R., see Lopez-Rivera, S., 10.
Pantel, R., see Moisan, M., 379.
Papargyropoulos, P.H., see Georgalas, C.G., 950.
Parsons, R.R., see Thewalt, M.L.W., 1691.
Parsons, R.R., see Ziemelis, U.O., 1041.
Parsons, R.R., see Ziemelis, U.O., 222.
Paulin, P., see Vanier, J., 1396.
Perluzzo, G., see Brebner, J.L., 915.
Perrin, A., Flaud, J.-M., Camy-Peyret, C., and Luc, P. Rotational analysis of the 13 200 and 13 400 cm^{-1} bands of NO_2 by means of Fourier transform spectroscopy, 1288.
Perrin, B., and Hedgcock, F.T. NMR study of magnetic doped semiconducting $(SnTe)_{100-x}$ $(MnTe)_x$ compounds, 1783.
Peternelj, J., see de Sobrino, L., 137.
Petrini, D. The theoretical KLL Auger spectrum of atomic Na^+ and Ne, 644.
Phillips, S. The anomalous mass dimension to two loops in quantum chromodynamics, 793.
Piché, M., and Bélanger, P.A. Mode-locking by an intracavity plasma. Part II. Experimental results, 77.
Pink, D.A., see Georgallas, A., 1678.
Pinnington, E.H., see Bahr, J.L., 1108.
Plischke, M., and Leckie, W.D. Temperature dependence of the pair correlation function in an inhomogeneous liquid: application to $C_{24}Cs$, 1139.
Poirier, M., Cheeke, J.D.N., and Germain, L. Magnetic field dependence of plate wave velocity and attenuation in metallic-glass ribbon, 385.
Poirier, M., and Cheeke, J.D.N. Phonon echo technique applied to adsorption isotherm measurement, 1053.
Popescu, I.M., see Lupaşcu, A., 654.
Potvin, L., see Abdel-Wahab, M.S., 1595.
Pouliot, D., see Abdel-Wahab, M.S., 1595.
Pratt, W.P., Jr. High precision electrical resistivity measurements on potassium below 1 K, 703.
Price, R.H., see Brumbaugh, B.E., 1155.
Pruneau, C., see Rangacharyulu, C., 815.
Pugh, R.E. Dynamical derivation of the Yang–Mills S-matrix, 1630.
Py, M.A., see Dahn, J.R., 307.
Rai, R. Jahn–Teller interaction in ferricenium cation, 329.
Raith, W., see Fraser, P.A., 565.
Ramia, M.E., see Armstrong, R.L., 397.
Ramsay, D.A., see Clouthier, D.J., 1212.
Rand, S.C., and Stoicheff, B.P. Elastic and photo-elastic constants of CH_4 and CD_4 obtained by Brillouin scattering, 287.
Rangacharyulu, C., Chatterjee, M.B., Pruneau, C., and St-Pierre, C. Gamma decay of $d_{5/2}$ isobaric analogue resonances in the $^{64}Zn(p,\gamma)$ reaction, 815.
Rangarcharyulu, C., see Szöghy, I.M., 959.
Raptis, A., and Kafousias, N. Magnetohydrodynamic free convective flow and mass transfer through a porous medium bounded by an infinite vertical porous plate with constant heat flux, 1725.
Read, L.A.A., see Dagg, I.R., 16.
Read, L.A.A., see Dagg, I.R., 1431.
Resnick, L. $e^+e^- \rightarrow e$ + heavy lepton by one photon exchange, 1682.

Ricard, A., see Moisan, M., 379.
Ricci, M.A., see Briganti, G., 88.
Rich, N.H., Clouter, M.J., Kiefte, H., and Ahmad, S.F. Low frequency Raman spectra of the liquid and plastic crystal phases of O_2, N_2, CO, and of Ar crystals with these molecules as guests, 1358.
Rich, N.H., see Kiefte, H., 1204.
Rioux, C., see Abdel-Wahab, M.S., 1595.
Ritoux, G., see Wick, A., 868.
Robinson, A.M., and Weiss, J.S. Absorption at 10 μm in CO_2–He and CO_2–N_2 mixtures at elevated temperatures, 1656.
Robson, J.M., see Gabriel, P., 632.
Rogiers, J. On the critical behaviour of the two dimensional spin $^1/_2$ *XY* model, 368.
Roguet, R., see Brun, L., 168.
Roth, C. Two- and three-body effective electrostatic interactions in odd configurations of the iron group, 1223.
Rowell, N.L., So, V.C-Y., Normandin, R., and Stegeman, G.I. Brillouin scattering in thin film optical waveguides. III. Experiments, 1821.
Rowell, N.L., and Stegeman, G.I. Brillouin scattering in thin film optical waveguides. I. Theory of the phonon modes, 1788.
Rowell, N.L., and Stegeman, G.I. Brillouin scattering in thin film optical waveguides. II. Scattering theory, 1804.
Roy, D., see Tremblay, D., 399.
Roy, J., see Ghosh, D., 805.
Roy, R , see Abdel-Wahab, M.S., 1595.
St-Pierre, C., see Rangacharyulu, C., 815.
Saksena, M.D., see Singh, M., 1730.
Sarma, P.B.K., Murthy, P.V.G.K., and Murty, C.R.K. Dipole moment and dielectric relaxation studies in some azo compounds, 257.
Savvides, N., McAlister, S.P., and Hurd, C.M. Electrical conduction in granular Cu–SiO_2 films, 1484.
Sa-yakanit, V., see Sritrakool, W., 373.
Scacco, A., and Jacobs, P.W.M. The absorption spectrum of KBr: Sn^{2+}, 619.
Schlesinger, M., Kent, R.D., and Drake, G.W.F. Construction of angular momentum eigenstates in the unitary group formalism for many-electron atomic systems, 357.
Schrader, D.M., see Armour, E.A.G., 581.
Schrader, D.M., and Svetic, R.E. The interaction of positrons with large atoms and molecules: theory, 517.
Schultz, R.J., see Hood, G.M., 1117.
Schulz, G., see Becker, K., 1168.
Sealock, R.M., Caplan, H.S., Zulkoskey, B.W., Szyjewicz, A., and Tomusiak, E.L. Electroproduction of low energy π^+ from ^{3}He, 1257.
Sears, T.J., and McKellar, A.R.W. Laser magnetic resonance of metastable krypton and xenon atoms, 345.
Sears, W.M., see Fortin, E., 901.
Sengupta, K., see Ghosh, D., 805.
Sguigna, A.P., Larabee, A.J., and Waddington, J.C. The half-life of ^{176}Lu by a γ–γ coincidence measurement, 361.
Shafi, M., see Khushnood, H., 1523.
Shafi, M., see Khan, A.R., 668.
Shanker, J., and Agrawal, H.B. Higher order molecular spectroscopic constants and dipole moment derivatives for diatomic alkali halides, 1187.
Sharma, R.C., and Spanos, T.J.T. The instability of streaming fluids in a porous medium, 1391.
Sharma, S.C., McNutt, J.D., Eftekhari, A., and Ataiiyan, Y.J. Positronium formation in gaseous ethane and ethane–Ne mixtures, 610.
Sharma, S.R., see Tiwari, R.S., 154.
Siara, I.N., Dubois, R.U., and Krause, L. Temperature dependence of cross sections for $7^2P_{1/2} \leftrightarrow 7^2P_{3/2}$ excitation transfer and for quenching in cesium, induced in collisions with H_2, N_2, CH_4, and CD_4, 239.
Signorelli, G., see Briganti, G., 88.
Simard, P.A. Déplacements des raies d'émission de l'ion ArII dans un plasma dense, 820.
Singh, M., and Saksena, M.D. A new electronic transition $C^2\pi_r$–$A^2\pi_i$ of AlO, 1730.
Slobodrian, R.J., see Abdel-Wahab, M.S., 1595.
Smith, H.J.T., and O'Byrne, T. Tunneling into a superconducting proximity sandwich, 117.
Smith, R.W., see Blake, N.W., 1720.
Smith, W., see Dagg, I.R., 1431.
Smith, W., see Dagg, I.R., 16.
Snider, R.F., see Turner, R.E., 1371.
So, V.C-Y., see Rowell, N.L., 1821.
Spanos, T.J.T., see Sharma, R.C., 1391.
Sprung, D.W.L., see Kohno, M., 1193.
Sritrakool, W., Glyde, H.R., and Sa-yakanit, V. The Fermi energy and screening length in n-type GaAs, 373.
Srivastava, R.N., see Tiwari, M., 273.

Stegeman, G.I., see Rowell, N.L., 1821.
Stegeman, G.I., see Rowell, N.L., 1788.
Stegeman, G.I., see Rowell, N.L., 1804.
Stein, T.S., see Kauppila, W.E., 471.
Stoicheff, B.P., see Rand, S.C., 287.
Stott, M.J., Zaremba, E., and Zobin, D. Quadrupole polarizabilities and Sternheimer antishielding factors in the density functional theory, 210.
Stott, M.J., and Zaremba, E. Energies of light atoms in uniform electronic host systems, 1145.
Stringat, R., see Fabre, G., 73.
Stroink, G., see Dunlap, R.A., 909.
Sur, S., and Ghosh, A.S. Low-energy positron–hydrogen molecule scattering, 597.
Svetic, R.E., see Schrader, D.M., 517.
Szöghy, I.M., and Rangarcharyulu, C. Isospin impurity and core polarization of $g_{9/2}$ IAR fragments in ^{59}Cu, 959.
Szyjewicz, A., see Sealock, R.M., 1257.
Tabata, T., see Fujishiro, M., 1672.
Tan, K.H., Bancroft, G.M., Coatsworth, L.L., and Yates, B.W. Mark IV "Grasshopper" grazing incidence monochromator for the Canadian Synchrotron Radiation Facility (CSRF), 131.
Taylor, R. The electron–phonon interaction in simple metals, 725.
Teichmann, J. A stability theorem for dissipative magnetohydrodynamic equilibria, 640.
Têtu, M., see Vanier, J., 1396.
Théberge, S., Miller, G.A., and Thomas, A.W. The cloudy bag model. IV. Pionic corrections to the nucleon properties, 59.
Thewalt, M.L.W., Ziemelis, U.O., Watkins, S.P., and Parsons, R.R. Photoluminescence studies of isoelectronic bound excitons associated with the deep acceptors In and Tl in Si, 1691.
Thewalt, M.L.W., see Ziemelis, U.O., 222.
Thewalt, M.L.W., see Ziemelis, U.O., 1041.
Thomas, A.W., see Théberge, S., 59.
Thompson, D.C., and Xu, G.-X. Optical measurements of vapor pressures of Rb and a Rb–K mixture, 1496.
Tighe, W., see McKen, D.C.D., 1247.
Timusk, T., see Zarate, H.G., 1008.
Tiwari, M., and Srivastava, R.N. The Curie temperature of a Heisenberg–Ising ferromagnet with uniaxial anisotropy, 273.
Tiwari, R.S., and Sharma, S.R. Dressed soliton in a plasma with two warm ion species, 154.
Tomusiak, E.L., see Sealock, R.M., 1257.
Tošić, B.S., see Mirjanić, D., 1838.
Townsend, L.W., Wilson, J.W., and Bidasaria, H.B. On the geometric nature of high energy nucleus–nucleus reaction cross sections, 1514.
Tremblay, D., et Roy, D. Propriétés des spectromètres électrostatiques à électrodes en spirale logarithmique, 399.
Tremblay, R., see Grover, C.P., 988.
Tremblay, R., see Grover, C.P., 993.
Tromp, J.W., and LeRoy, R.J. An improved method of representing and extrapolating diatomic molecule rotational constants, 26.
Tsuboi, M., and Hirakawa, A.Y. The 240 nm band system of methylamine: a preliminary analysis of the rotational structure of the 0-0 band of CH_3ND_2, 844.
Tsujimoto, T., see Fujishiro, M., 1672.
Tudorache, St., see Lupaşcu, A., 654.
Turner, R.E., Dahler, J.S., and Snider, R.F. Projected evolution superoperators and the density operator: theory and applications to inelastic scattering, 1371.
Umapathy, S., and Krishnamurthy, N. Second order infrared absorption spectrum of carbon dioxide in the condensed phase, 314.
Vallee, R., see Chrostowski, J., 1303.
van der Meer, M.P., see Cook, J.G., 1311.
van Dijk, W., see Nogami, Y., 205.
Vanier, J., Kunski, R., Paulin, P., Têtu, M., and Cyr, N. On the light shift in optical pumping of rubidium 87: the techniques of "separated" and "integrated" hyperfine filtering, 1396.
van Kempen, H. Normal metal point contacts, 740.
Varshney, V.P., Gupta, K.K., Chaubey, A.K., and Gupta, D.K. Mean life predictions in respect of $K^\pi = 2^+$ collective excitations in deformed even nuclei, 1461.
Vassilikou, A.B., see Koumelis, C.N., 1241.
Vervloet, M., et Merienne-Lafore, M.F. Constantes moléculaires de (100) $\tilde{X}^2B_1$ de NH_2: observation et estimation de la vibration v_3, 49.
Vincent, D., see Moffat, J.W., 659.
Vrba, J., Fife, A.A., Burbank, M.B., Weinberg, H., and Brickett, P.A. Spatial discrimination in SQUID gradiometers and 3rd order gradiometer performance, 1060.
Waddington, J.C., see Ardal, J., 1534.

Waddington, J.C., see Sguigna, A.P., 361.
Wadehra, J.M. Elastic scattering of intermediate-energy positrons and electrons by alkali atoms, 601.
Wang, G.J., and Weichman, F.L. The temperature dependence of the electrical conductivity and switching phenomena in Cu_2O single crystals, 1648.
Watkins, S.P., see Thewalt, M.L.W., 1691.
Watson, J.K.G., see Herzberg, G., 1261.
Watson, P.J.S., see Clarke, J.N., 1561.
Weichman, F.L. Internal Schottky barriers in semiconductors, 269.
Weichman, F.L., see Wang, G.J., 1648.
Weinberg, H., see Vrba, J., 1060.
Weiss, J.S., see Robinson, A.M., 1656.
Wertheimer, M.R., Klemberg-Sapieha, J.E., and Corriveau, R. Optical properties of plasma-polymerized organosilicone films, 628.
Whitmore, M.D., see Magaña, F., 424.
Wick, A., Zepp, G., Ritoux, G., et Fabre, G. Localisation de l'énergie transportée par une onde électromagnétique à la surface d'un conducteur de section circulaire, 868.
Wilson, J.W., see Townsend, L.W., 1514.
Winterbon, K.B., see Lee, H.C., 405.
Wiser, N. Is potassium a simple metal?, 693.
Woloschuk, K.J., see Mavroyannis, C., 245.
Woloschuk, K.J., Hontzeas, S., and Mavroyannis, C. Excitation spectra of a three-level atom in the "lambda" configuration at high photon densities. II. Numerical results, 968.
Wong, S.S.M., see Haq, R.U., 1502.
Woolley, J.C., see Goodchild, R.G., 1096.
Woolley, J.C., see Lopez-Rivera, S., 10.
Wright, G.L., see Heyland, G.R., 503.
Xu, G.-X., see Thompson, D.C., 1496.
Yates, B.W., see Tan, K.H., 131.
Yemenidjian, N., see Lombos, B.A., 35.
Zafar, M., see Khan, A.R., 668.
Zafar, M., see Khushnood, H., 1523.
Zarate, H.G., and Timusk, T. The plasma resonance of electron-hole drops in uniaxially stressed germanium, 1008.
Zardas, G.E., see Koumelis, C.N., 1241.
Zaremba, E., see Stott, M.J., 210.
Zaremba, E., see Stott, M.J., 1145.
Zeitnitz, B., see Jeremie, H., 1616.
Zepp, G., see Wick, A., 868.
Zhuravleva, G.I., see Arifov, P.U., 1717.
Ziaei, M.E. The effect of core electrons on the spin transfer parameters, 636.
Ziemelis, U.O., Parsons, R.R., and Thewalt, M.L.W. Temperature dependent Zeeman study of bound exciton and bound multiexciton complex photoluminescence in Si (P) and Si(Li), 222.
Ziemelis, U.O., Thewalt, M.L.W., and Parsons, R.R. Sharp-line, donor–acceptor pair recombination luminescence in Si(In,Li), Si(Ga,Li), Si(Al,Li), and Si(B,Li), 1041.
Ziemelis, U.O., see Thewalt, M.L.W., 1691.
Zobin, D., see Stott, M.J., 210.
Zulkoskey, B.W., see Sealock, R.M., 1257.